U.S. BOAT & SHIP MODELER

RADIO CONTROL

U.S. BOAT & SHIP MODELER

SPRING 1994
DISPLAY UNTIL MAY 5

THE **COMPLETE** MODEL NAUTICAL PERIODICAL!

Edina: A Yacht Club to 'Model'

MARINE SURVEYS

Super Candy from Futaba

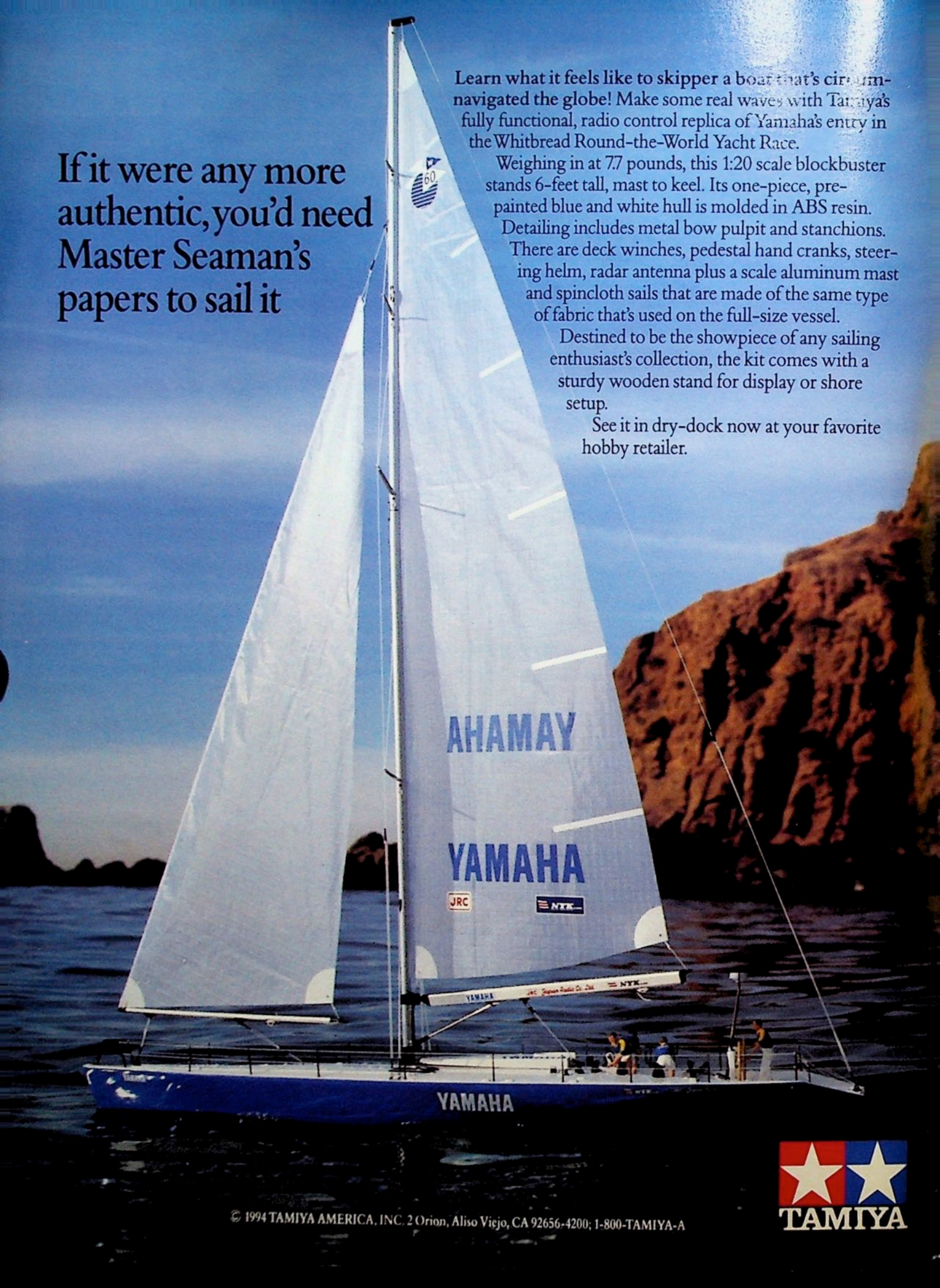
13cc Outboard from K&B

Fairwind II Sailboat from Kyosho

1/4-Scale Crackerbox

Fact and Fantasy: RC Warship Combat

TWO CLASSIC TUGBOATS TO BUILD


If it were any more authentic, you'd need Master Seaman's papers to sail it
Learn what it feels like to skipper a boat that's circumnavigated the globe! Make some real waves with Tamiya's fully functional, radio control replica of Yamaha's entry in the Whitbread Round-the-World Yacht Race.
Weighing in at 7.7 pounds, this 1:20 scale blockbuster stands 6-feet tall, mast to keel. Its one-piece, pre-painted blue and white hull is molded in ABS resin. Detailing includes metal bow pulpit and stanchions. There are deck winches, pedestal hand cranks, steering helm, radar antenna plus a scale aluminum mast and spincloth sails that are made of the same type of fabric that's used on the full-size vessel.
Destined to be the showpiece of any sailing enthusiast's collection, the kit comes with a sturdy wooden stand for display or shore setup.
See it in dry-dock now at your favorite hobby retailer.
AHAMAY
YAMAHA
JRC
NTK
YAMAHA
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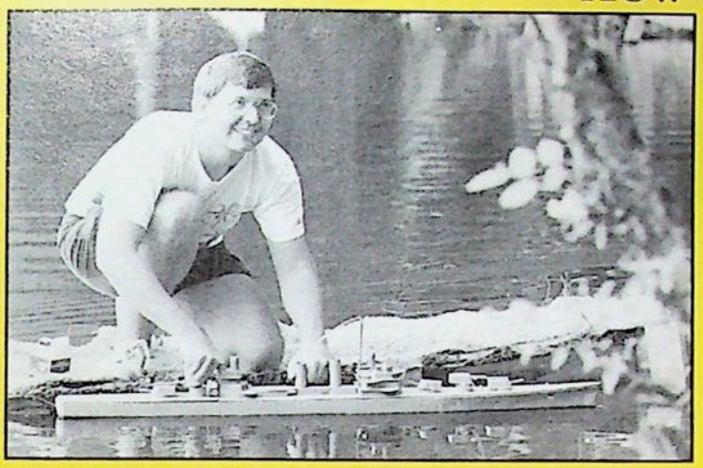
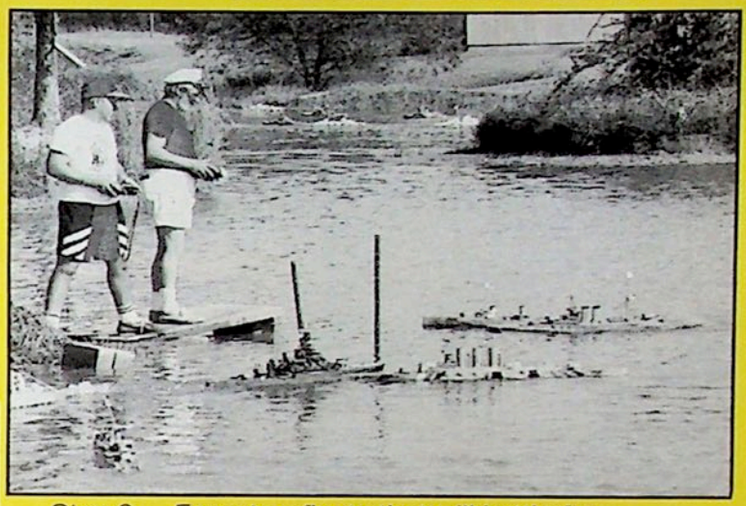
TAMIYA

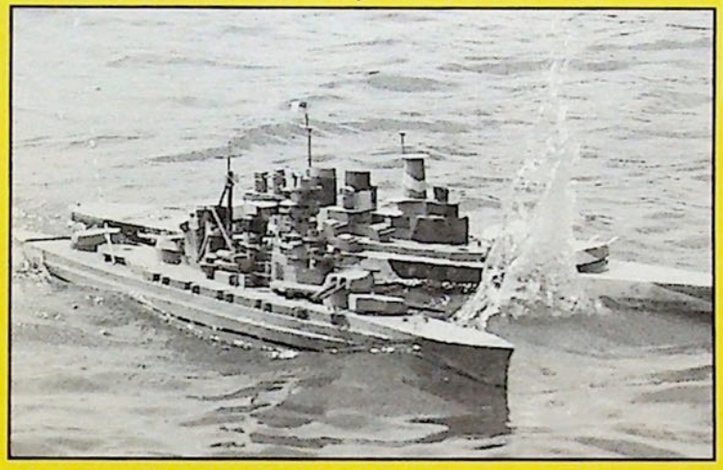
How to *Turn Friends Into Enemies !*



Step 1 Build and launch 1/144 scale model warships armed with low power BB cannons.

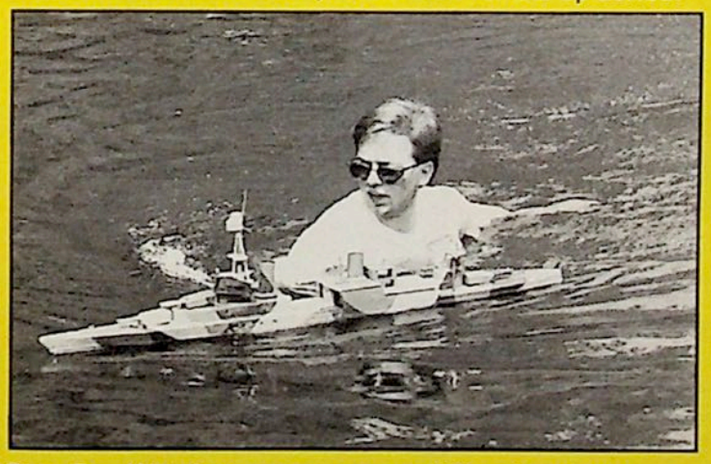


Step 2 Form two fleets that will battle for control of a lake in fleet versus fleet combat.



Step 3 GO IN HARMS WAY!! Close with the enemy ships, fire your cannons at the side of their soft balsa covered hulls, and watch for BB splashes.

Step 4 Wait for a damaged enemy vessel to fill with water and sink to Davey Jones Locker.



Step 5 Watch your new enemy (friend) get wet retrieving his newly baptised model warship. BEWARE! Next battle, YOU may be the one taking a swim.

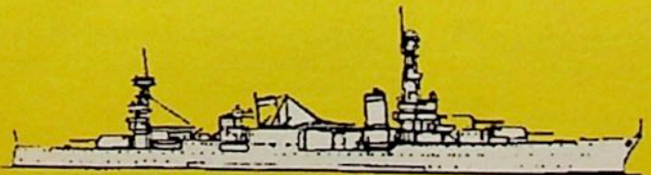
DISCOVER,

R/C MODEL WARSHIP COMBAT !!

The hobby where scale model warships armed with low power BB cannons actually shoot holes in each other to SINK the enemy.

SKUNKWORKS MFG. offers a full line of 1/144 scale warship kits for WWII era cruisers and battleships in both wood frame and fiberglass frame construction. Also offered are the BB cannon systems, CO2 pressure systems, bilge pumps, and hardware necessary to compete in the sport of R/C Model Warship Combat.

To receive our latest catalog of kits and accessories, an information brochure about this hobby, and a copy of the battling and construction rules from the INT'L R/C WARSHIP COMBAT CLUB, send $ 6.00 to us at the address below. For a two hour VHS videotape of ships in action add $ 18.00.



SKUNKWORKS MFG.

Mailing address:
Rt. 2, Box 81-A, Springfield, MO 65802
Ph: (417) 831-2309, 9-5 CDT, Mon-Fri

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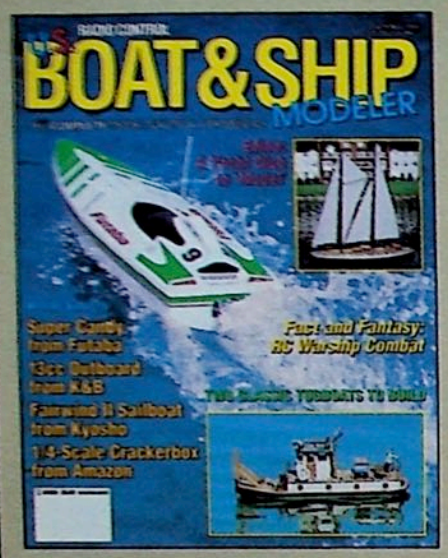
U.S. BOAT&SHIP MODELER
Super Candy from Futaba
13cc Outboard from K&B
Fairwind II Sailboat from Kyosho
1/4-Scale Crackerbox from Amazon
Fact and Fantasy: RC Warship Combat

ON THE COVER

The Super Candy deep vee, the first of a new hot line from Futaba, is a winner, and reviewed on page 36. Upper inset: Sail and electric RC boats are the staples of the Edina Model Yacht Club of Minnesota, one of the nation's most successful model clubs, featured on page 32. Lower inset: Tugboats—their RC popularity is growing by leaps and bounds—are featured prominently in this issue, on pages 10, 18, 22 and 44.

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U.S. BOAT & SHIP MODELER

SPRING 1994
VOLUME 7 / NUMBER 4 / ISSUE #28

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U.S. BOAT & SHIP MODELER (ISSN 0899 496X) is published quarterly by Gallant Models, Inc., 34249 Camino Capistrano, Capistrano Beach, CA 92624-0459. Phone: (714) 496-5411. Subscriptions in U.S. $14.00 for one year, $25.00 for two years. Single copies $5.00. Outside U.S. (except APO, EPO, FPO): Canada $20.00 one year, $37.00 two years; other foreign, $19.00 one year, $34.00 two years. All payments must be in U.S. funds.

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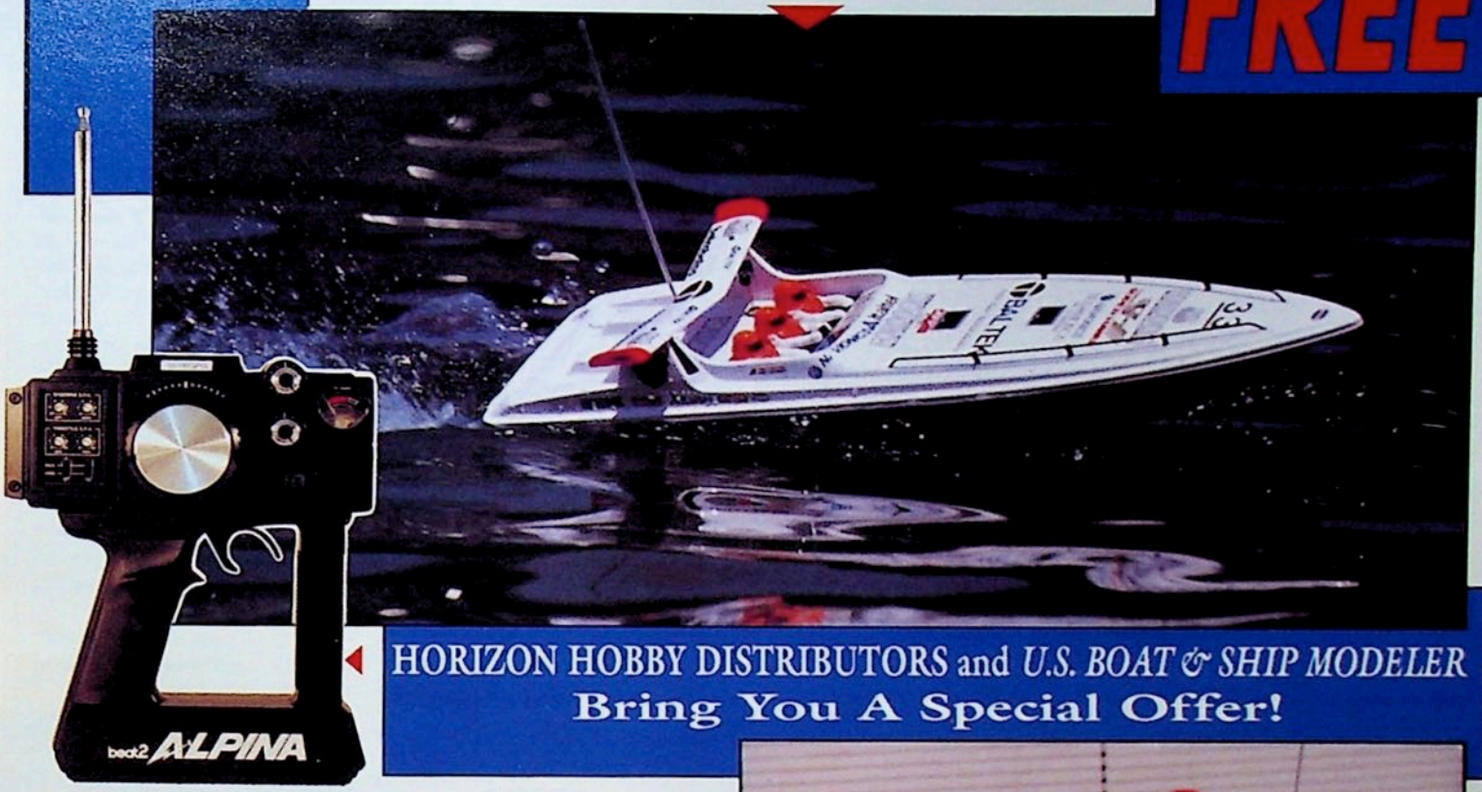

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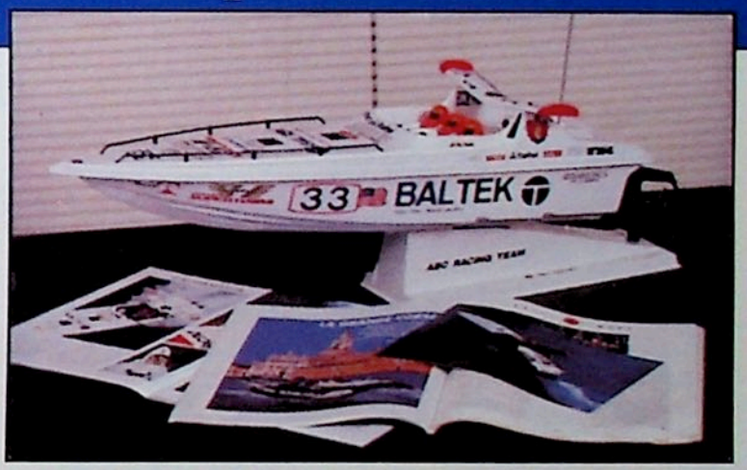

Four times this year,
U.S. BOAT & SHIP MODELER will award a **FREE** Baltek® Deep V Scale Electric Boat, and JR Alpina Radio to a lucky subscriber. It could be **YOU!**

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Renew your present subscription or take out a new subscription to U.S. BOAT & SHIP MODELER using the special coupon below. You will be automatically entered into the quarterly contest. At the end of the quarter, we draw a name and that lucky person will win a FREE Baltek® electric boat kit with JR Alpina radio — valued at more than $250! The Baltek® is 25-1/2 inches long, powered by an M&Y 550SH electric motor with Super Prop-Ride drive system. The JR Alpina radio has two channels with ABC&W receiver that features BEC, two JR 507 servos, BEC switch harness and battery holder. Features include servo reverse, variable rate steering, end-point adjustments, throttle and steering trims. Both can be yours — FREE! You must use the coupon below and only one entry per individual per month. (No purchase necessary.) BALTEK® is a registered trademark of the Baltek Corporation.

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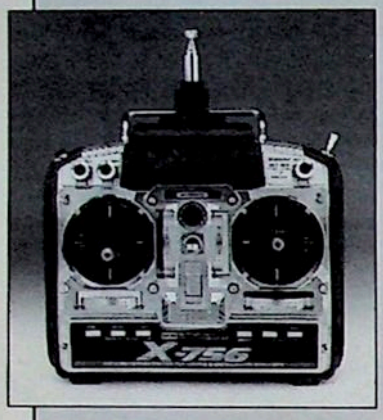
SHIP'S STORE



COMPUTERIZED CAR/BOAT RADIO

JR has introduced the X-756 twin-stick, computer surface radio system. Based upon the highly-advanced JR R-756 pistol-type radio, the X-756 unites the advanced features competitive car and boat racers demand with the unique feel and control of a twin-stick transmitter.

The X-756 begins with silky-smooth adjustable-tension, stick gimbals for precise model control. To that, it adds a unique trim change alarm, trim memory for six models, direct servo control, model naming and PCM/PPM modulation. Selectable function dials let the user customize switches for easy access to travel adjustment, brakes, and the 75-lap timing feature.

For added model tuning, the X-756 incorporates a new dual setting exponential function for both throttle and steering. With the flip of a switch, a racer can now go from softened servo action around neutral back to linear control.

From JR, Distributed by Horizon Hobby Distributors, 4105 Fieldstone Rd., Champaign, IL 61821; (217) 355-9511.

VEE SPORT FROM HITEC

The Vee Sport is a 1/12-scale model on an exisiting boat made by Cruiser International, Inc. The model is so realistic with stainless steel rails and brass fittings that it could pose as a static model. The model is equipped with a Mabuchi 540 motor and comes with a fully factory-assembled hull. All it requires is installation of a radio, details and decals. You can install up to three 7.2V NiCd batteries for extended running time. Model is 29.5" long, 10.23" beam and 13" high.

From Hitec RCD, 10729 Wheatlands Ave., Suite C, Santee, CA 92701; (619) 258-4940.

CA AND EPOXY FROM TOP FLITE

Top Flite, manufacturer of popular MonoKote brand coverings and airplane kits, has introduced a line of CA and epoxy adhesives called Top Flite Supremes. The Supreme CA is crystal clear and sets fast to produce a strong, dependable bond. Each bottle includes a tapered tip for easy application.

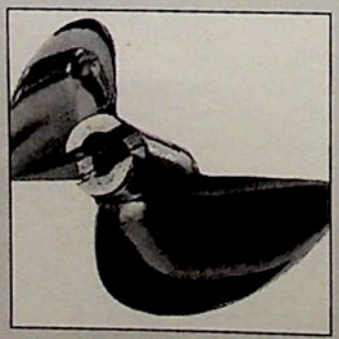
Top Flite Supreme CAs are available in thin, thick and slow-set formulas. Supreme 6- and 30-Minute Epoxies are available in 9-ounce bottles. The Top Flite Supreme adhesive line is also complete with Debonder, in 1-ounce bottles, and Activator, in a 2-ounce spray bottle, and 8-ounce refill.

From Top Flite, distributed by Great Planes Model Distributors Co., 2904 Research Road, Champaign, IL 61826-9021; (217) 398-3630.

NEW ALLOY FOR PRATHER PROP

Prather Props are now available in a new, stronger bronze alloy, which is 50% stronger than the older beryllium copper alloy. This will allow the modeler to put a sharper edge on the prop, and it lasts longer. The prop is also easy to sharpen and balance.

Prather will also continue to sell boat props in the popular stainless steel alloy, which remain the strongest and resist corrosion better than any other prop available.

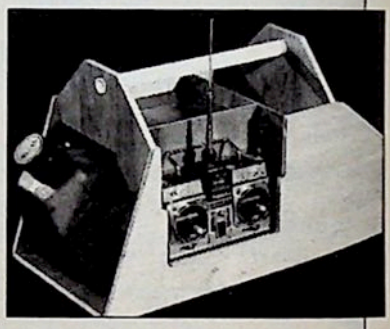


From Prather Products, Inc., 1660 Ravenna Ave., Wilmington, CA 90744-1398; (310) 835-4764.

RC DOCK BOX WITH FUEL TANK

This sturdy and versatile dock box from Flight Deck Enterprises is constructed of high grade 3/8" and 1/4" plywood and is shipped fully assembled, complete with a one-gallon fuel tank. Versatile design will accommodate all power panels, fuel pumps, starts, batteries and boat gear. Side storage rack for transmitter allows easy and safe access to throttle control during start-up.

Deep storage compartment accepts cleaning bottle and starter. Other features include hollow carrying handle (to route wire or fuel tubing), storage area for tools and parts. Right and left hand versions guarantee smooth, efficient starts with maximum safety. Fuel tank location minimizes center of gravity shift as tank empties. Shipped with field-tested setup suggestions.



From Flight Deck Enterprises, P.O. Box 843, Chico, CA 95927-0843; (800) 895-0010.

NEW KIT FOR WARSHIP COMBAT

The *USS Brooklyn*, an American WWII light cruiser, is available in 1/144-scale, especially for the sport of RC Model Warship Combat. Kit includes fiberglass hull frame, plywood deck, prefab superstructure parts, molded tur-

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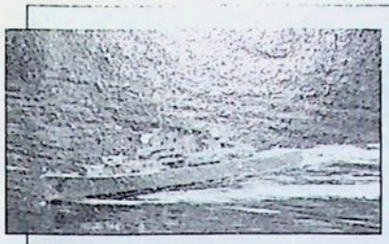


rets, radio box, rudders, prop shafts and plans.

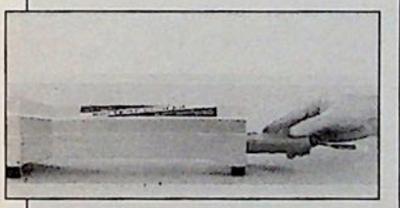
It's length is 50.69 in., beam is 5.15 in. A "class 3" ship by IR/CWCC rules, the *Brooklyn* is allowed two 50 round BB cannons and one bilge pump. Priced at $150.

For a catalog of model warship kits, hardware, BB cannon systems and CO_2 systems, a brochure about the sport of RC model warship combat and a copy of the battling and construction rules of the IR/CWCC send $6.00, and for a two-hour VHS tape of model warships in action, send an additional $18.00 to Skunkworks Mfg., Rt. 2 Box 81-A, Springfield, MO 65802; (417) 831-2309.

COOL YOUR HOT NICADS

Nicad batteries should be cooled off between uses, before recharging, and this Nicad Cooler shortens this cooling period. Connect to a 12V battery. Fans draws only 200 mA. Holds up to 30 cells and a double stack. Assembles quickly from its preformed parts.

From Hobby Lobby, 5614

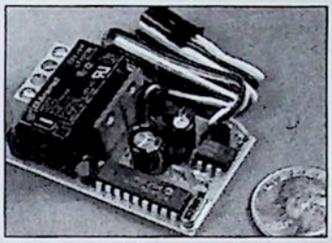


Franklin Pike Circle, Brentwood, TN 37027; call (615) 373-1444 for free catalog.

NAUTICAL THROTTLE

The Reliable Nautical Throttle is directed at electric boat modelers engaged in scale or mild performance racing. It can handle from 7 to 16 cells at 30 amps continuous current (50 amps peak) and offers proportional forward and reverse control. Microprocessor control assures smooth precise control of speed from an idle where you can count the rpm visually, all the way to 100% power, with minimal losses.

The unit measures 1.3x2.2x.9" and weighs 1.4 ounces. It includes screw-clamp block for motor and battery connections and a JR type receiver plug. No adjustments are necessary, as the unit is set up for all standard RC systems. Two programs are



available in the control. As shipped, the unit is center OFF. A race mode allows the stick travel to offset to 1/3 stick travel for reverse, and 2/3 travel for forward, making the forward speed control more precise.

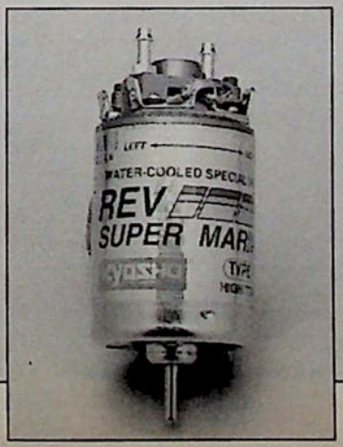
From Jomar Products, 3440 Riverhills Drive, Cincinnati, OH 45244; (513) 271-3903.

HIGH-PERFORMANCE FOR ELECTRIC RC

Kyosho has unveiled two new electric marine motors that are designed to provide virtually any RC boat enthusiast with greater performance, run time and motor life than stock power plants can deliver. These motors feature adjustable timing and an endbell water cooling unit. They're compatible with direct drive water pickups and standard hull pickups. Adapter hardware is included for water pickup and water outlet.

For gear reduction applications, Kyosho offers the high-speed Super Marine Type G motor, which emphasizes power over rpm. For direct drive models, Kyosho introduces the high-torque Super Marine Type D motor that's ideal for small, fast, high-performance boats, including Kyosho's Viper.

From Kyosho, distributed by Great Planes Model Distributors, 2904 Research Road, Champaign, IL 61826-9021; (217) 398-3630.



CABLE GREASE FROM BOCA

A "next generation" cable grease for RC hydro deep-Vs, outboards and ducted fan engines has been developed by Boca Bearing. Called "Midas Touch Marine Cable Grease" is a space-age lubricant that chemically bonds to metals, filling in microscopic pits and grooves, and leaving a tough, impervious, corrosion free surface that is virtually frictionless. As a grease applied to boat cables, it improves performance, reduces cable wear, lowers the temperature by reducing friction and extends cable life.

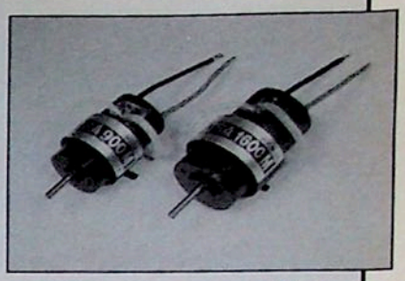
Boca is also introducing

"Midas Touch Marine Power"—a fuel additive and run-off oil for boat engines—designed to enhance engine performance and reduce friction and wear.

From Boca Bearing, 7040 W. Palmetto Park Road, Suite 2304, Boca Raton, FL 33433; (407) 998-0004.

WATER COOLED MARINE MOTORS

Graupner's Ultra Marine Motors have the same specs as powerful Ultra 900, 1600 and 1800 motors plus these have a built-in water cooling jacket and water-cooled brush housings. The Ultra 900 Marine diameter is 1-1/2" and weighs 11 ounces. Ultra 1600 Marine has 2" diameter, weighs 14.8 ounces. Ultra 1800 Marine diameter is 2",



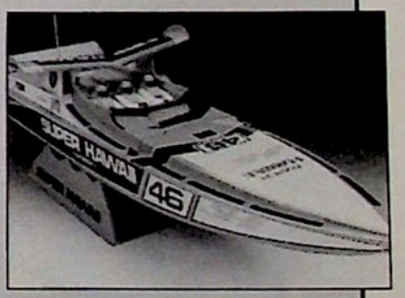
weight is 20 ounces. Maximum number of cells is 12 for Ultra 900 Marine, 20 for Ultra 1600 Marine and Ultra 1800 Marine.

Distributed by Hobby Lobby, 5614 Franklin Pike, Brentwood, TN 37027; call (615) 373-1444 for free catalog.

DUAL MOTOR DEEP-V RACER

With a race-proven hull, twin-motor propulsion and a reasonable price, the ABC Super Hawaii Boat will make big waves at the local boating pond. The full-size Super Hawaii is a winner, taking the gold at both the 1989 U.I.M. Class World Championships and 1989 European Championships, and this model, when mated with a pair of 550-SH motors, gives the ABC racer speed and agility worthy of its larger counterpart.

The model comes with a factory-joined hull and deck for reduced assembly time. A pre-assembled forward/reverse, proportional, mechanical speed controller



lets the user accurately regulate power. A high-capacity, waterproof radio/battery box, efficient dogbone prop drive system and a "super cavitation" propeller make roostertails standard issue.

From ABC Hobby, distributed by Horizon Hobby Distributors, 4105 Fieldstone Rd., Champaign, IL 61821; (217) 355-9511. •

ONE HOT HAWAIIAN

With twin 550 motors turning 20,000 RPM, the Super Hawaii makes the trip across the pond a quick one.

If the sleek new Super Hawaii looks like a winner to you, that's because frankly, it is.

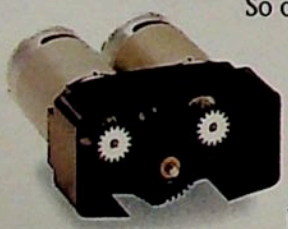
Having captured both the World and European Offshore Championships, the Gancia del Gancia team took their winning hull, added 200 HP diesels, and are out for a repeat victory with their new Super Hawaii.

ABC engineers carefully scaled down the full-size hull to a 40" model, complete with strakes, steps and V-shaped bottom. The result is a design that cuts the chop just like the big boys.

Quick to rig

Your ABC boat will get wet quicker because the hull is not only pre-formed, but also pre-joined.

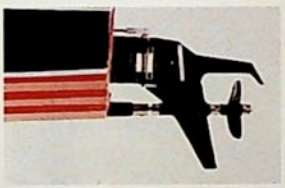
So only the fun work is left.



You'll get to build the outdrive, assemble the gear box and install your two-channel radio.

Everything you'll need is included except for radio, charger, batteries and a few basic tools.

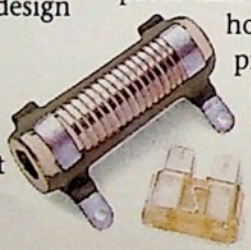
And when you're done rigging your hull, you'll find duplicating the Gancia's team colors easy with the mylar decals provided. So complete, you won't even need a single can of paint.



Modified for performance

A boat that looks this good standing still just begs to be fast, and the Super Hawaii delivers.

Six or seven-cell battery packs turn the twin Mabuchi 550SH motors into horsepower. A single surface propeller provides the thrust. And the geared transmission makes it efficient for the longest possible runs.



And to add to your satisfaction on the pond, ABC includes a special heavy-duty speed control which is designed to give you smooth, proportional control of the power. It's even fused for reliability.

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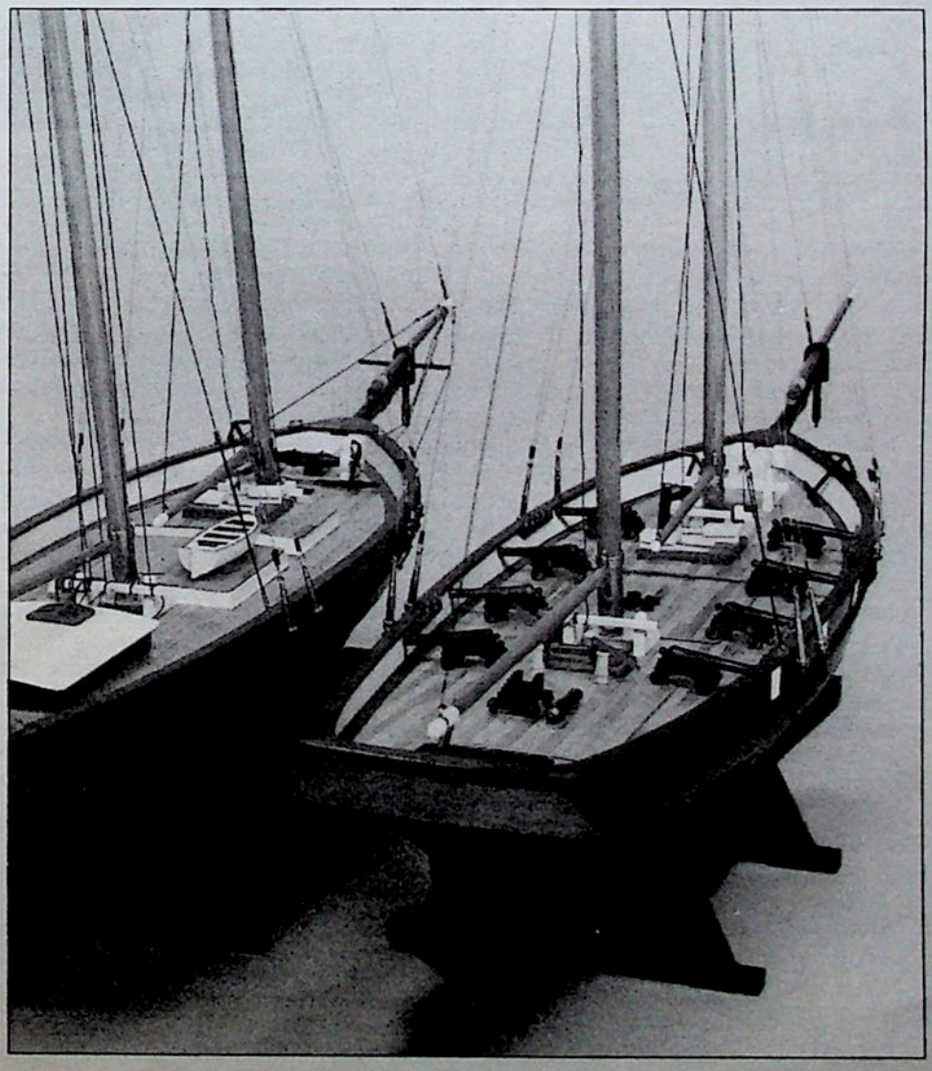
THE BALTIMORE Clipper

■ RIGHT: Builder John Veal stands by the large "Baltimore Clipper" model—it's five feet long. ■ BELOW: The Baltimore Clipper is available as a model of the modern Pride of Baltimore or as an 1815 privateer complete with cannons.



BY BILL RICE

The Baltimore Clipper was a truly remarkable fighting ship that appeared out of Baltimore and Virginia waters during and just after the Revolutionary War. It continued to operate until about 1850, serving in several capacities—as a blockade runner, a US Navy fighting ship, a smuggler, pirate rum runner and a slaver, according to John Veal, an engineer-turned-model-builder who is marketing a kit version of this ship—in either a partially built or completely built according to the buyer's wants.

The model being presented is of the *Pride of Baltimore II*, launched in Baltimore in 1990. This *Pride* hails back to an earlier *Pride* that was launched in 1977 but sank off the U.S. Virgin Islands in 1986 with a loss of four of her crew. The original parent craft were of French origin and several came over to aid in the Revolutionary War.

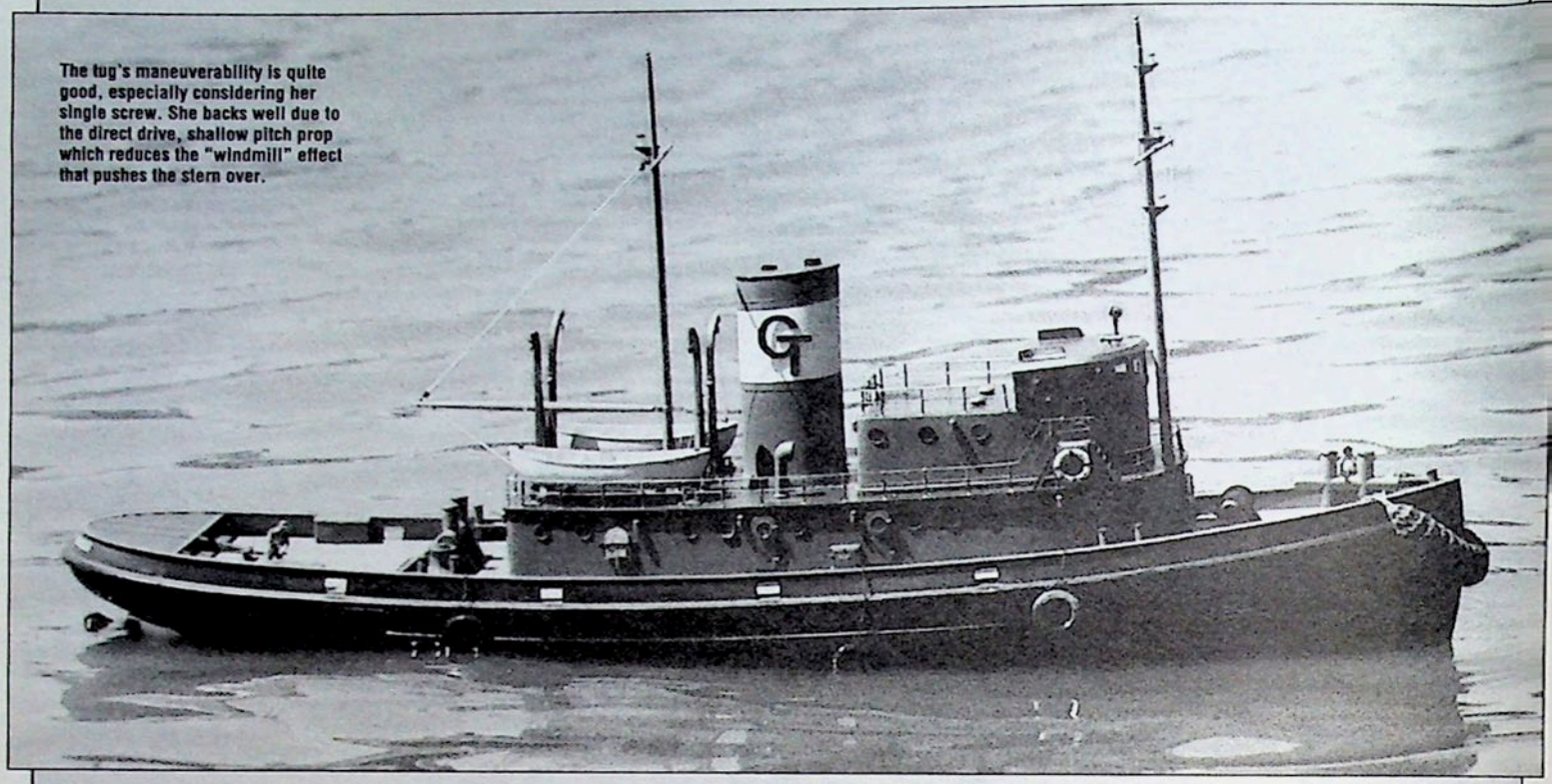
Speed was her greatest attribute in the battles as she was able to escape to windward over the more traditional heavy Man-of-War vessels of the time.

Quantities of these vessels were 140 in 1776, 73 in 1777 (due to war attrition), 115 in 1778, 167 in 1779, 228 in 1780 and 440 in 1781. Fighting tactics were unique in that several phases of a battle ensued. First, the chase, whereby the fleet vessels jockeyed for position. Second, a salvo or two to cripple the spars and sails, and then a ramming followed by a boarding and the usual pirate style battle.

Veal's model of the Baltimore Clipper is 3/8" = 1 foot, giving practical dimensions of 5 feet overall length, 46 inches high and 10-1/2 inches abeam. As can be seen in the photos, spars, hull and basic deck layout are identical for three versions of the boats. The different deck layout, furnishings and add-on rigging allow them to be displayed as the Pride of Baltimore circa 1930 or 1987, or as an early 1800's privateer complete with cannons.

The ship kits are somewhat expensive as real turnbuckles, working sheaves and yard trusses are machined from brass. The kit has large molded pieces of plywood, mahogany and ABS plastic already formed. The models are so large that hinged mast steps are provided for ease of shipping and ease of carrying to your local pond. The models are structurally sound, having mast and yard scantlings of 5/8" and 3/8". Brass chain plates are 1/4 by .060 inch and standing rigging is .022 inch x 7-stranded stainless wire. Decks and bulwarks are 1/4" minimum leading to a thoroughly touchable and usable model.

Veal is operating this new venture as Starboard Models and can be reached at 15601 Saddleback, Santa Clarita, CA 91351; telephone (805) 252-4251. •



The tug's maneuverability is quite good, especially considering her single screw. She backs well due to the direct drive, shallow pitch prop which reduces the "windmill" effect that pushes the stern over.

Building a Tugboat from The Scale Shipyard Semi-Kit

BY KURT GREINER

Like many modelers, I have always liked tugboats as modeling subjects. They are interesting, perform well, and are varied enough so one can find a prototype that suits their taste. Tugs can be modeled in a variety of scales with success, due to the wide range of size that real life tugs encompass. As a result, it is a rare gathering at the local pond that does not have at least one example of this type.

After spending some time searching through catalogs, I found that Lee Upshaw, owner of The Scale Shipyard in Long Beach, California, had several items that fit the bill. I decided that his semi-kit for the *Edmund J. Moran* would be ideal for my purpose. At about 32" long it is a good, mid-sized hull that is large enough not to disappear in the vastness of the lake, and yet not cumbersome to transport and handle. The Moran was a classic American design from the 1940's, distinguished as the only unarmed tug to sink a U-boat (by ramming) during World War II.

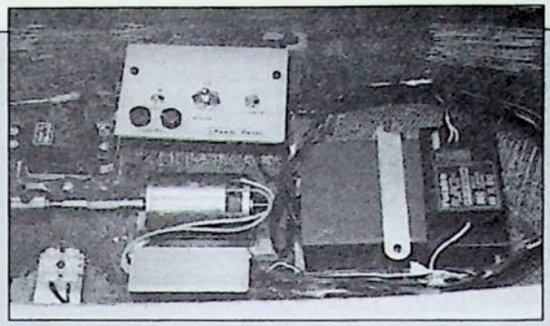
I decided on the semi-kit, which included the hull, superstructure casting, stack and an assortment of resin fittings. These arrived in good condition several weeks later (All items from The Scale Shipyard are made to order). I did notice some warpage on the superstructure molding, which Lee then replaced for me, although I probably could have repaired it.

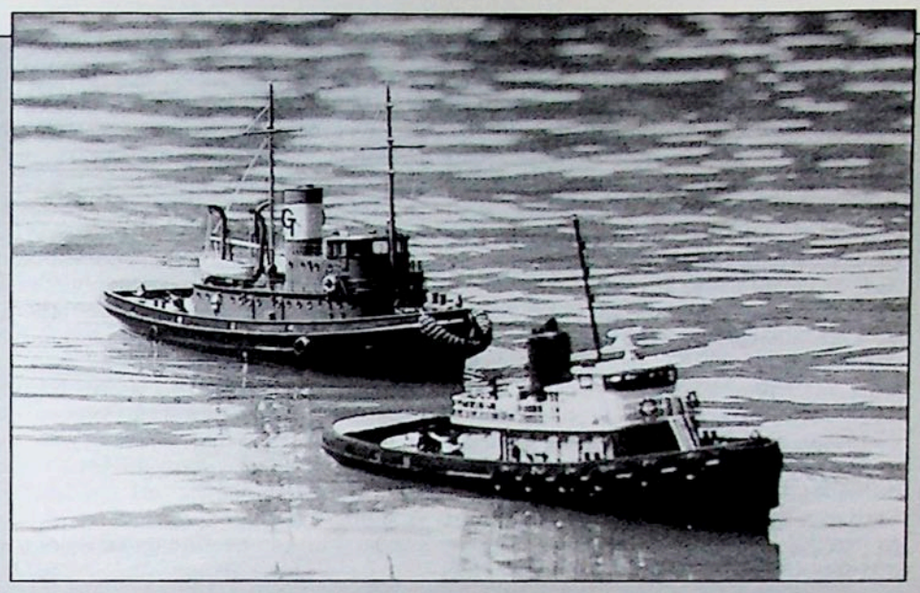
With the hull and parts in hand, I studied the drawings to get a feel for the vessel. I decided to customize the model a bit to add some features that I liked, and remove others I did not. Once these changes were sketched in, I then planned out the radio control installation. This included checking the capacity of the hull for battery, motor and the like, but also deciding on access points for the equipment, where switches and charging jacks would be located and other considerations. This was done using a combination of the plans and the empty fiberglass hull. Sometimes you can " eyeball" the installation, but often it helps to take cardboard and mock-up the components to assure a good fit. Once this was done, I then proceeded to prepare the hull.

Because of the smooth gelcoat finish of the hull, it really needs little preparation before priming. A quick sanding with some 400-grit sandpaper gives the paint some surface to adhere to. A couple of chips in the hull, which I caused through my carelessness, were quickly filled using a product called Evercoat, a substance similar to Bondo automotive body filler but with a much finer grain, more like spot putty. It sets in just a couple of minutes, sands easily and feathers to nothing. It is also a remarkably strong adhesive and possesses a lot of structural strength. Once the outside was prepared, I turned my attention to the inside of the hull.

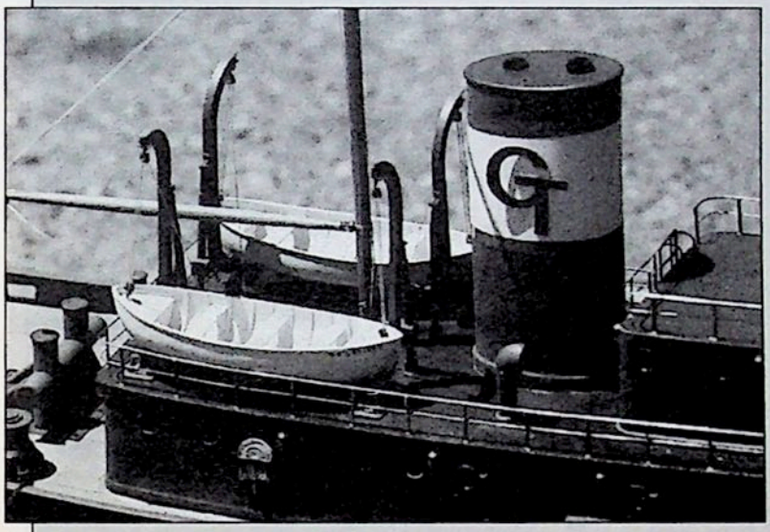
One important consideration when dealing with fiberglass is assuring proper adhesion of parts to the hull. Many adhesive systems work well with fiberglass; my preference is for slow speed Zap-A-Gap for initial bonding with a layer of Evercoat troweled in for reinforcement. The key to successful bonding is in the preparation of the surface. Depending on what surface is to be bonded, I will grind with a motor tool, or sand with rough sandpaper, the goal being to roughen up the surface for better contact and to remove waxes used in the fiberglass process. I treated all areas of the hull I anticipated would be glued in the future.

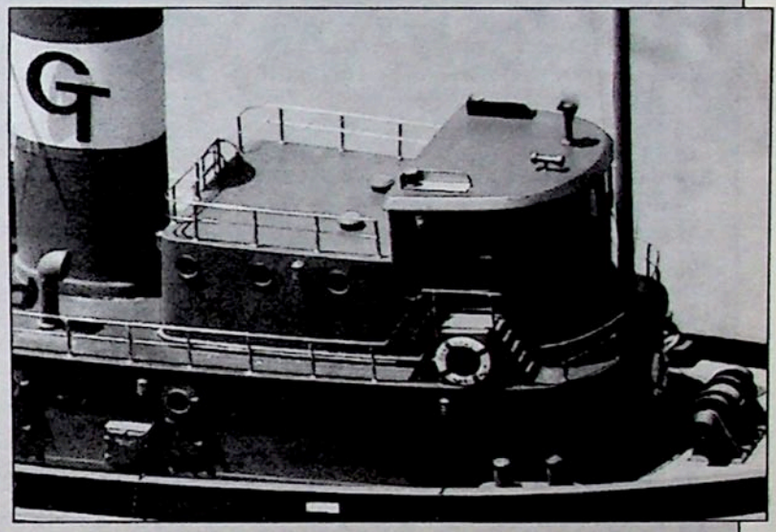
The first item to be installed on the hull





■ **ABOVE: Installation in the hull is clean with motor, battery, Hitec speed control, electrical control panel, servos, etc. The motor mount was made from sheet brass. ■ RIGHT: The *Dorothy K. Greiner* is running with a sister ship of sorts. Troy Waters' *Sea Otter* was built from The Scale Shipyard's *Carol Moran* semi-kit, a slightly smaller vessel. Troy has extensively modified the kit to reflect a tug used in the Los Angeles area. ■ BELOW: After forming, the lifeboats were cut from the plastic sheet, detailed with strip styrene, painted, and lettered with the ships name. The davits are strip and sheet styrene with brass fittings. ■ BELOW RIGHT: Stanchions were made from brass wire drilled on a jig for the rails. Most small fittings are The Scale Shipyard's resin pieces, included with the semi-kit.**





was the rudder. The Scale Shipyard provides a nice cast resin rudder with the semi kit that needed only minor clean up before use. A hole was drilled from the top to the bottom to accept a 1/8" diameter brass shaft which would be the rudder post. This was inserted into the rudder, and glued with thin Zap super glue. Because of water pressure on the rudder, I did not want to take a chance that the bond would break, leaving me without steering, so I drilled and tapped a hole for an 0-80 brass screw through the rudder and rudder post. With this installed, the rudder is much more secure against this type of failure. A rudder tube was cut from a section of K&S brass, and the rudder post was inserted in it to clean off the burr. Once the tube was ready to be installed I located and drilled a hole through the hull for it.

The tube was installed and adjusted to the proper angle, which in most cases should be vertical with no yaw to one side or the other. I find it easier to line up the tube by putting a long rod of the proper diameter inside the tube and extending this up above the level of the deck. Any error will be magnified by the length of the rod, making correction easy. Once satisfied by the adjustment, I put some Slow Zap around the hole and shot it with accelerator to "freeze" it in place. This held the adjustment temporarily. I then built a dam out of plastic around the tube, extending 3/8" up from the bottom of the hull and 1" around. Into this, I poured some Evercoat. When this hardened, the tube became a permanent part of the boat. The whole process took less than 20 minutes from start to finish.

I next drilled a 1/8" hole in a brass strip to receive the portion of the rudder post that extended below the rudder. The strip was fitted to the bottom of the hull, then screwed in place into an evercoat base. If needed, this piece can be removed to pull the rudder from the boat.

The next item to be made was the stuffing box for the propellor shaft. I am fortunate in having a small lathe and milling machine, so some of my methods may be a bit unusual. It is not necessary to have these machines to build a perfectly good stuffing box, but I like to use them and the end result is neat and easy to use.

I start with a stainless steel shaft of high chromium content. These can be found in hobby shops that cater to gas boat racers. I find the best kind are those shafts which are made from non-magnetic alloy. I then cut a one-inch piece of brass tube that was a slip fit over the 3/16" shaft. This was to be my bushing at the end of the shaft. A tube one size larger than that was found and cut to form the body of the stuffing box. This was checked closely for straightness and then polished. On my lathe, I machined a combination adapter, oil reservoir, and bearing holder for the inboard end of my stuffing box. This was milled for an oil tube, and then all the components of the stuffing box were soldered together. Once this assembly was complete, it was installed in a similar manner as the rudder tube, with Zap and Evercoat.

A propeller was then needed. Although there are many companies that make fine propellers, I usually prefer to make my own. This allows me to experiment with variables such as blade area and pitch to get the best combination for a particular boat. As I try to avoid gear boxes whenever possible, for noise purposes, this is especially important if reasonable running time and power are to be expected.

I start with a blank of brass for the hub, turned to shape with a combination of cutting with tool bit and filling in the lathe. A 3/16" hole is drilled at the base to receive the shaft. The finished hub is mounted on an index attachment and three slots are cut into the hub 120 degrees apart. The slots should be the same size or even a fraction smaller than the blades so that they are a press fit.

The blades were rough-cut out of brass sheet, taped together using doublestick tape, and filled to the same profile. The blades are then separated, filed slightly on the edge, and sanded and polished.

The next step is to press them onto the hub. Ideally, they should be a tight enough fit to require light tapping with a hammer to seat them. If this does not happen I take a center punch and raise "craters" on the edge to displace enough metal to take up the gap. The propeller is then soldered together using a torch. After this was done, the propeller was cleaned and polished.

Next a hole was drilled and tapped for an Allen head setscrew. This was obtained from a Du-Bro wheel collar. Finally, after a flat was ground on the shaft with a motor tool, the propeller was slipped on and the setscrew tightened. Loctite Blue wicked into the junction adds extra security. If needed, the propeller can be removed using mild heat to break the bond.

With the propeller and shaft finished, it was time to consider the motor installation. I had already decided on a 6-volt Pittman surplus motor from a local electronics outlet. A little larger than the familiar Dumas/Pittmans that are available across the country, this was also about 1/10 the price, and has very good characteristics. A motor mount was fabricated from sheet brass, and this was mounted in a bed of Evercoat in the usual manner.

The battery used is a 6-volt, 4-amp hour Power Sonic, a brand I find very useful for RC boats. I prefer six volts because of the availability of a good quality speed control that handles this voltage. In addition, lights and other components from Robbe use this voltage. The capacity of the battery, 4 amps, was chosen for size and weight considerations, and has proven adequate for extended running.

In addition to a tray for the battery, I fabricated a hold down which bolts across the battery to secure it even in choppy seas. Nothing can reduce your boating enjoyment more than a battery shifting your model's ballast on its own!

A brass holder was cut out and bent to form the steering servo mount, and this was mounted to the hull with Evercoat. The tiller arm for the rudder was fabricated from a strip of brass and a Du-Bro wheel collar and connected to the servo with a length of rod. I used a Du-Bro ball joint at both ends of the rod; a little overkill, perhaps, but I like the smooth action.

The speed control used is a Hitec SP-6/10. I use this whenever I possibly can as they are excellent units, very reasonably priced. Mine came from The Scale Shipyard, but they are available nationwide as well. I mounted it on a platform of brass, but did not make a tray. Instead, I used hot melt glue to mount the unit to the plate which had been fixed to the inside of the hull with Evercoat. This leaves the unit open to radiate its heat into the surrounding air.

With the basic components in place, it was time to start wiring the model. I believe in having a control panel that brings all the circuits together for charging and switching. Mine is made from a sheet of .060 plastic that had been cut and drilled to receive the various switches, etc. It was then painted and labeled with rub-on letters. Switches for radio, motor and lights were installed, and wires soldered on them. The wires go down to barrier strips where they are screwed in place; these make for a neat wire job, and are available at Radio Shack.

Another advantage of the system is ease of maintenance and testing. An amp meter was temporarily installed in line between the battery and the balance of the electrical system, and monitored to determine the load on the battery.

The model was placed in the water and run at full speed while secured to the shore. The steering servo was exercised back and forth and the total load read 1.5 amps. This equates to over two hours running time for the model with the 4-amp battery which is plenty for my purposes. This figure would be reduced at night with the lights on, however.

Once the final electrical tests were done, it was time to put the deck on. First a strip of wood was beveled slightly at the top and bottom and bonded to the inside of the hull just below the level of the finished deck. This was done using a "guage" made from scrap that hooked over the hull and determined the proper depth. The wood strip was placed to contact the guage and clamped in place.

Where needed to conform to the curve of the hull, cuts were made in the strip to allow it to bend easier. These were later filled with Evercoat. The strip was tacked in place with Zap-A-Gap and then Evercoat was troweled into the bevels. On top it was made smooth so the deck would fit, but on the bottom a filet was left for added strength

Cross beams were made from 1/4" plexiglass and set at intervals to support the deck and add strength to the hull. These can be used to set camber, if desired. They were installed using the super glue/Evercoat technique.

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A pattern out of heavy paper stock was made to template the deck. This was made about 3/32" smaller than the actual opening. Using this, a sheet of plastic was cut for the deck. After checking the fit, openings for access were cut and the deck was checked once again. When satisfied with the fit, I applied Weld-on #16, a thick plastic cement, to the deck beams and the edge of the deck, and the deck was laid in place. Weights were used to assure proper adhesion. When dry, the gap between the deck and the edge of the hull was filled with Evercoat and sanded smooth.

Next, the hull was pierced for freeing ports along the side. These were laid out, drilled and then filed to the final diameter. The bulwarks were sanded next, filled where necessary and primed with Floquil primer from an airbrush. A cap rail was made from three plastic strips, laminated together on the model to form the curves, particularly at the stern. This was filled and primed as well.

The hull was now ready for priming, and this was done with Martin Senour auto body red enamel primer. This is a nice color for the bottom of the hull, which can be masked when dry. From the waterline up the hull was painted Floquil Engine Black, with the cap rail and bulwarks Milwaukee Orange. Two coats of Testors' Semi-Gloss were sprayed on after the paint had thoroughly dried.

To assure the watertight integrity of the hull, a coaming was built up 5/8" around the deck opening. This was made using styrene sheet cut into strips. A full enclosure was built at the stern around the access to the rudder post. This was later covered by the stern grate.

The deckhouse was the next item. The Scale Shipyard includes a molded line on this part to assist in trimming. I used a resin cutoff wheel in a motor tool to rough trim the molding after I highlighted the line with a black marking pen. Sanding to the line completed the process. I cut off the top of the molding to put a deck of 1/8" plexiglass in its place. I think this is easier and looks better with a nice lip around the perimeter of the deck. This was attached in the usual manner. Once the deckhouse was fitted to the model, but not yet detailed, I began work on the deck.

One feature I wanted on this model was a planked, wooden deck. I started with 4"x24" sheets of 1/8" Midwest basswood, and sprayed both sides black. The black represents the caulking between planks. Once dry, I set up my Dremel table saw and cut 1/16" thick strips. These were cross-cut into 2-1/2" long planks. The final result was 1/8" wide x 1/16" thick.

Margin plans were laid down first, along the perimeter of the deck and around major pieces of deck equipment. The planking then continued, using Slow Zap as the adhesive. When fully planked, I sanded it smooth and put four coats of Deft brand semi-gloss finish, sanding lightly between coats with a 3M pad.

Assembling the resin deck fittings was the next task. The towing bits were made in one piece, and required the centers cut out, and light sanding before priming. I used Floquil primer on all the resin parts, followed by the appropriate color of Floquil paint, with a Testors' overcoat for protection. Other bits, capstans, chain lockers and other sundry fittings were prepared in the same manner. Once completed, the fittings were drilled for brass rod pins to increase the attachment strength of the part. Special attention was paid to the tow bits, which used two 1/8" rods set into the underlaying deck beam for maximum strength. I intended to tow with this boat, and did not want to leave my bit behind!

The cabin, which had already been fitted to the deck, was drilled for portholes next. I make my own ports using thin sections of brass tubing prepared on my cut-off saw. These are glued together. The "glass" for the port are disks of .010 clear plastic that have been punched out of a sheet with a homemade punch and die. These are secured in place with a drop of Devcon 5-minute epoxy which seals the port and also gives a nice look to the

continued on page 57

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RADIO WAVES

BY ELOY MAREZ

CHANNEL EXPANDERS

The modifying of a transmitter's individual channels to perform more than one function has proven to be a very popular subject, with a lot of my incoming mail being devoted to the subject. Additionally, and a most welcome change for the often neglected and forgotten RC boater, a number of commercially manufactured channel expansion systems have appeared—seemingly all of a sudden!

This month, I have yet one more such device to share with you, an interesting one with some interesting features. But first, for the benefit of those that have just joined us—and maybe also for those that are always saying or thinking, "I know I read it, but I can't remember where." I think it is time we present a compendium of previously presented channel expander material and the issue in which it appeared.

Spring '91. Original discussion of the subject; with simple explanations of how your mechanical commands at the transmitter are transformed into electronic pulses (encoding) and transformed back into mechanical motion at the receiver (decoding). Included is a simple, but workable, channel expansion system which you can add to your own transmitter, to command a servo to stop at any programmed points of its rotation. Nothing sophisticated about this one—in fact it can be said to be rather crude, but you can tailor it to your needs, it is simple, inexpensive, uses only common electronic store components—and it works!

Fall '91. Detailed descriptions of two commercially available channel expander systems, by coincidence both originating with our neighbors to the north. The first one is called the Switch Four, by Model Control Devices, of Toronto. The Switch Four provides—you guessed it—four operations from a single channel, requires no installation or changes at the transmitter, all being doing with a decoder which senses stick position and turns things on or off as you decide. It does require a little skill on the control stick, but I found from experience it appears harder than it actually is to stop where needed. The decoder is equally simple, it plugs into the mating channel on the receiver.

Secondly, this month we have the JEM 112, by JEM R/C Electronics Research, in Nepean, Ontario. This one provides twelve switching operations, some latching (on until commanded to go off) and some momentary; your choice! It is a keypad operated control, and does require some work on the transmitter, but it is minimal, consisting only of removing three wires from a control pot and splicing them to three wires entering from the keypad. The decode unit simply plugs into the associated channel on the receiver.

All transmitters generate the necessary signal, the question comes in finding it on an very crowded PC board, without either drawings or a scope.

Summer '93. Another commercial unit, the "7 Channel Multiswitch" from High Sky, San Diego. It is obviously designed to provide seven individual operations from two two-axis stick controlled channels. Such operations can be permanently on until commanded to go off, or momentarily on. This one does not require any changes to the transmitter—the seven functions come about by. moving the stick to all possible extremes; the four corners and full left/right, full up/down. No, I didn't miss-count, I know those are eight positions. One of them, full down, center, is used first when you want the next command to be on only as long as you hold the stick in the proper position. Without a prior full down, center input, the commanded channel will stay on until you use the same command to turn it off. More than one of the additional channels can be on at the same time. The decoder, like most others, requires only mating to the receiver.

As you may have already gathered, the decoding of all of these devices is far more complex than the encoding, most of them being able to perform there very exacting operations through the blessings of a microprocessor.

Fall '93. I had many queries about whether, and how, the JEM 112 would work with the popular Ace R/C Nautical Commander. After answering "yes", and "perfectly", I was then asked just how to make the hookup, so that I saw the time had come to do a "JEM Meets the Nautical Commander" column—just follow the instructions, you can't go wrong.

The columns also include related material about theory, hookups, applications, etc., all intended to help you understand more about the subject, and thus to enjoy more what you started out to do in the first place.

USB&SM will have back issues of all of the above, for $5 each.

• • •

Let's press on while we are up on the step, shall we? The latest related bit of electronic wizardry to come my way is the "Model 127 R/C Channel Extender", the product of PR Designs, Inc., 48 Cutler Rd., Andover, MA 01810; (508)470-0498. The Model 127 converts a single proportional channel in your transmitter into seven channels. It differs from all those previously mentioned in one very important respect—in hat most such devices result only in basic on and off operations. The Model 127 however, while it does provide two on and off functions, also provides five fully proportional functions.

This is an important point, and will make a significant difference in some installations, so lets walk through it once again: PR Designs Model 127 Channel Extender is the only one that I have received information about that provides additional proportional controls that you can vary as you need to control scale like functions. All others that I have discussed previously were on and off controls; the only difference being that some can remain in either state as long as you want while others will remain on only while that one specific command in given and held.

The Model 127 encoder requires some connections, and actually a little work on the transmitter side. The connections are simple; rerouting the three wires that normally connect to a control pot or in some cases, a switched channel, and splicing

them to three wires coming from the encoder board. Also required is a new connection from the transmitter's encoder integrated circuit to a fourth wire into the 127 encoder.

Now here is another important point! All the installation information refers to making this installation to a transmitter designed around the popular Signetics NE5044 7-Channel Encoder IC. And in fact, the instructions received detail installation into the Futaba FP-6NFK transmitter. However, the connections required are basic to any 5044 transmitter encoder and the installation should go off without a hitch. Installation to those transmitters not using the 5044 as the encoder can still be made, requiring only the location of the encoder's output and the fourth wire mentioned connected to that point.

I have contacted PR Designs who frankly admits that they do not have access to every transmitter ever made. Well, who does - there must be hundreds. Anyway, while PR does not now have the proper connection point for all encoders, as they do for the 5044, they will locate it for you, even if it involves asking you to send in your transmitter. The important fact is that all transmitters generate the necessary signal, the question comes in finding it on an unfamiliar and usually very crowded PC board, without either drawings or a scope. PR Designs wants the information for as many transmitters as possible, so they will work with you if yours is the first one of a certain type—those that follow using similar equipment will of course receive the necessary information.

In addition to providing you with proportional controls, the Model 127 encoder has another feature that will appeal to many of you. It allows you complete flexibility on just how and where to mount the new channel controls. As received, it is a bare PC board, with pre-wired control pots and switches attached. Sound intimidating? Well, not so, the instructions will provide all the guidance you will need. You will need only to provide a small housing—your nearest electronics supplier will have them in all sizes and shapes—install the controls in the manner that is the most convenient and logical to you, and attach it anywhere on the transmitter that you like.

As a matter of fact, a sample control arrangement is included in the instructions, but bear in mind that it is strictly a suggestion. What is important is to arrange things in such a way that you are able to operate them completely automatically without having to take your eyes of your model. Then too, if seven additional channels is more than you need for a particular application, and you fear you will find all those controls confusing, simply leave the unused pots and/or switches unmounted, inside the enclosure—use this device to control your boat, not to have it control you!

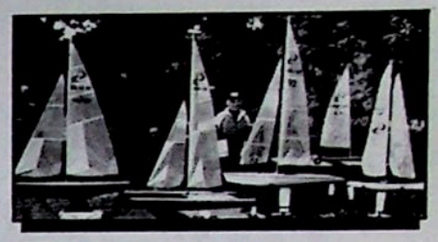
Now for the other end of the installation—the decoder. Actually, it is simpler than the encoder was, requiring only a servo type connection to the receiver, all additional servos plugged into it, and whatever connect ions you may want to make to the switched outputs, if any. As in all such connections, property polarity must be maintained, both in the harness to the receiver, and in the servos. The polarity sequence used is fully described in the text, and printed right on the PC board. It will be correct for systems like Futaba, JR, and possibly others, but incorrect for Airtronics and others. It is important to be 100, correct in this case, as reversed voltage connections can be fatal to a lot of electronic components. With the units and the instructions in front of you, the whole thing is easier to understand and to plug things in properly.

If you should be using servo plugs that are coded in a sequence different from the one used on the 127 decoder, it is simple to change them. Look at the plug—depending on the brand, you have only to lift a small plastic tab on the body, or possibly depress a small metal one on the pin, to unlock the pin and release it from the body. Take out the necessary ones, reinsert them in the proper sequence, and—after checking them once again, plug them into the decoder and get on with the rest of the installation.

The rest of the installation consists only of plugging servos into as many of the additional five proportional channels; the same as you would a receiver. The two switched channels can be thought of as switches—when they close, whatever is connected to them will operate. Full instructions are included, including the use of an external battery to operate all these added functions if they are heavy current users and will be operating repeatedly. The decoder comes to you as a plain printed circuit component board, and must be protected from vibration, shock and water. A common sense installation is definitely called for, don't consider using it for an anchor!

The NE5O44 IC mentioned was for many years the standard for RC transmitter encoders , and is widely used by Airtronics, Futaba, JR, and yes, even the Ace Nautical Commander. Such information can be obtained from the maker or importer of your system; well, some of them anyway. Let's face it, some of them won't talk to you and others won't know. Check with PRD—or with me (SASE please), we'll definitely help.

PRD's Model 127 Channel Extender is warranted for 180 with the usual "don't mess with it" provisos During or after that period, service is available, as well as support and advice in your installation and application. It is priced at $129, from PR Designs. •



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product survey

BY JERRY DUNLAP

THE K&B MANUFACTURING 13CC OUTBOARD

The latest addition to the model marine outboards available from K&B Manufacturing is a 13cc (.82 c.i.) version. The powerhead for this engine is based on the 13cc K&B ducted fan engine. The 13cc powerhead, which shares the same case as the 11cc engine, fits on the 11cc outboard lower unit. K&B squeezes two additional cc out of the 11cc case by changing the bore and stroke to create the 13cc outboard.

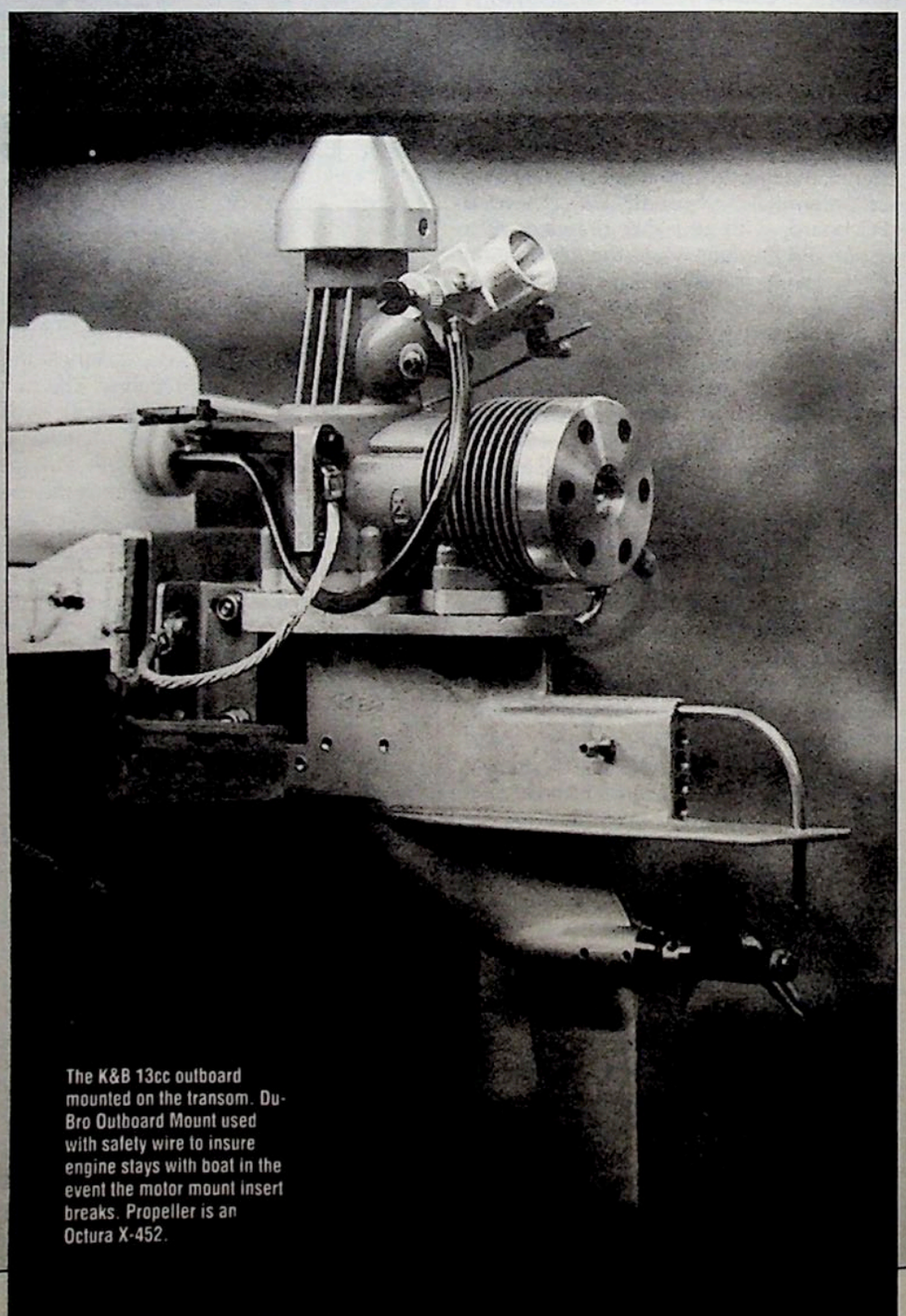
Knowing I enjoy model tunnel boats, Skip Wagner at K&B provided one of the 13cc outboards for me to test. I elected to install the engine on the new wood kit version of the Dumas Sprint 7.5. A complete review of this boat was featured in the Summer 1993 issue of USBSM. The only change I made to the boat that is different from the kit is to add an additional 1/8" plywood piece to the sponson bottoms. This deepens the tunnel depth by that amount.

Turning tunnel boats with 7.5cc or larger outboards requires the use of a high powered servo. I use a Futaba S-34 for steering and to connect the steering servo to the engine, a Du-Bro Solid Steering Kit was used. This is the first time I've installed one of the solid steering kits on one of my tunnel boats and I think they really make sense for the larger size engines.

For the initial running I had the Du-Bro black plastic motor mount insert on what I call the high setting. The biggest prop I had in my tool box was an Octura X-452 and that became the prop of choice. I filled the tank with Byron's 45% nitro fuel. The option exists with this engine to reduce exhaust noise by running water from the cooling head into the lower unit. I decided to run the water into the lower unit on my first test runs to check sound levels both with and without using water in the lower unit.

The engine started easily and I ran it for five or six minutes at half throttle to allow for a little break-in time. Running the water into the lower unit definitely helped reduce the noise level. This is not to imply the K&B 13cc is a quiet engine, but it isn't as noisy as the 11cc. The induction of water into the lower unit definitely brings the noise level below the required sound limits of the national model boating associations. However, it also increases back-pressure, which will prevent the engine from reaching maximum power potential.

When I opened up the throttle, the



The K&B 13cc outboard mounted on the transom. Du-Bro Outboard Mount used with safety wire to insure engine stays with boat in the event the motor mount insert breaks. Propeller is an Octura X-452.

engine was somewhat rich and I elected to just run out the first tank of fuel with this setting. For the second run, I made an adjustment to the needle-valve to lean the mixture. The engine didn't seem to like my adjustment and quit shortly after being released. The boat was retrieved, the needle-valve opened up and the engine ran without quitting, but it still sounded rich. The needle-valve was adjusted slightly and the engine quit again.

One of my fellow boat club members suggested adding a head shim. I removed the head and discovered it already had two head shims, so I removed one of them. The head bolts were tightened and the engine started once again. It still didn't sound like it was developing full power. I brought it back to the beach for another needle-valve adjustment. This time the engine had a nice powerful sound and the boat was moving very well. Although it was displaying good straightaway speed, it didn't want to "hookup" in the corners, tending to slide when making full power corners. Preferring not to remove the engine and switch the motor mount insert, I just ran the boat a few more times and slowed the boat in the corners.

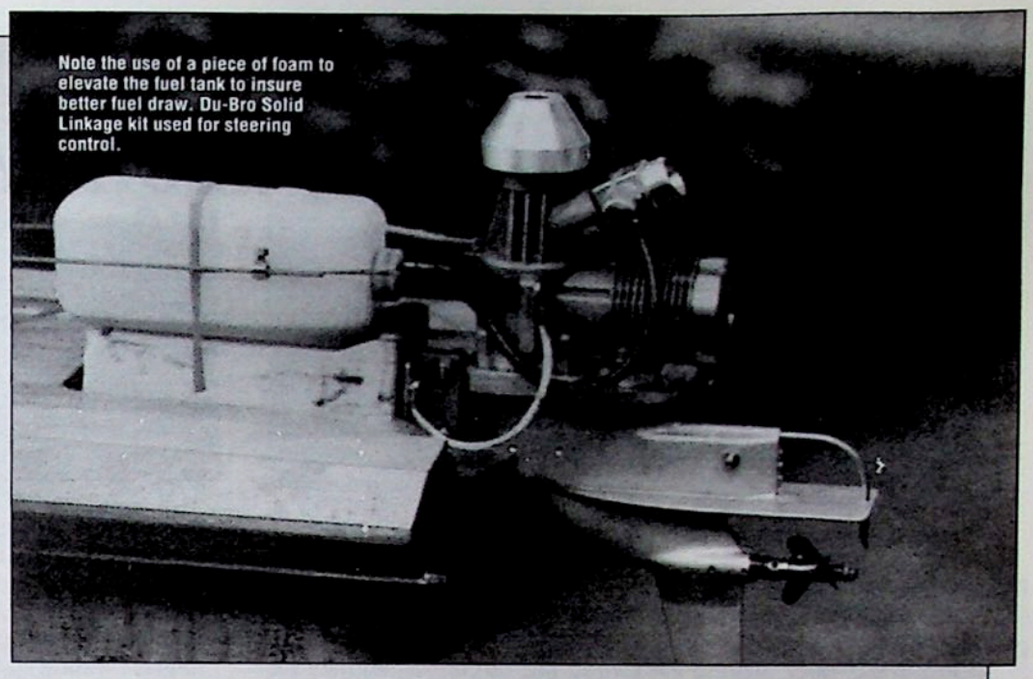
When I returned home I removed the engine from the transom and flipped the motor mount insert to lower the prop. The next opportunity to run the boat was the 1993 Northwest Outboard Championships. I was really looking forward to seeing how well the boat and engine would do under race conditions. Unfortunately, a bad launch right off the starting dock the first time I tried to run the boat that day resulted in an upside-down boat. The boat was upside-down for about five minutes and I discovered my radio box seal was not waterproof. A wet radio system eliminated me from any further running.

Before attempting to run the boat and engine again, I rebuilt my radio box lid to insure a better surface for the tapedown hatch lid. "The third time is the charm," was appropriate for the next time I attempted running the K&B 13cc outboard. With the lower engine setting, the center line of the prop is positioned 3/8" below the bottom of the sponsons, the boat really hooked up in the turns. I was making full throttle turns around our 1/10 mile electric course. The boat was riding rather flat and although this made for excellent cornering, it prevented the boat from obtaining optimum top speed.

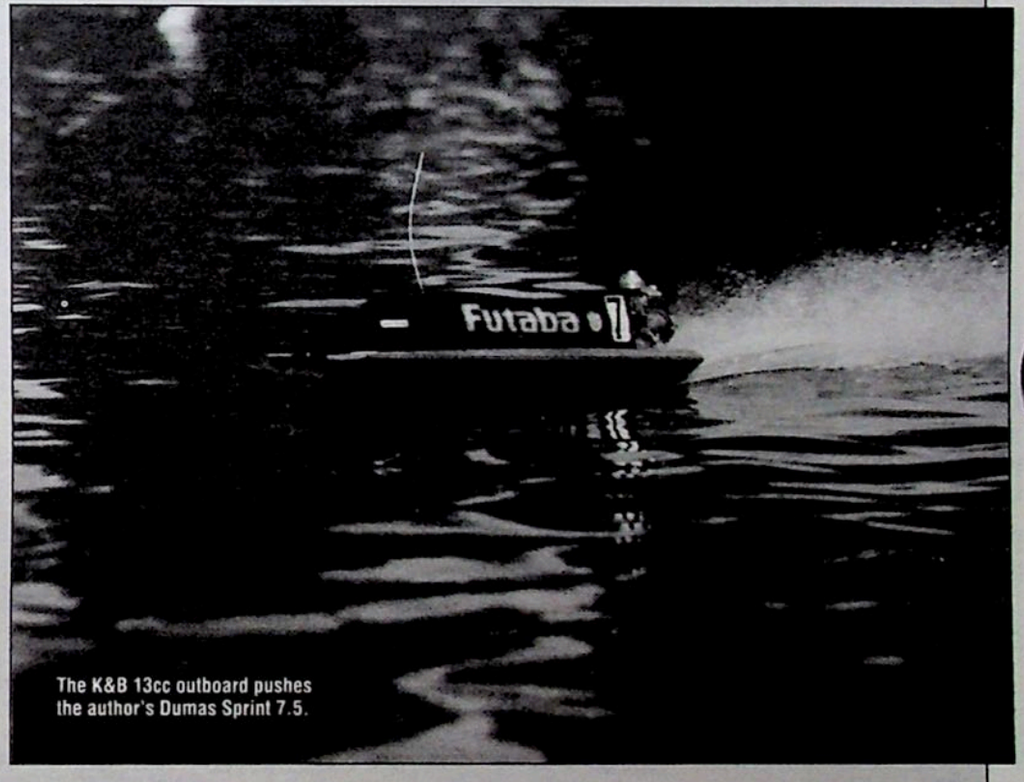
Upon check the prop angle, I noticed a slight amount of negative prop angle. I adjusted the prop angle to a neutral setting. This means the centerline of the prop shaft is parallel to the bottom of the sponson running surface. This neutral setting allowed the bow to lift and what a difference that made. The boat was noticeably faster, but it would no longer hookup as tightly in the corners under full throttle.

The next change I tried was disconnecting the tubing connecting the water cooled head to the lower unit. It took a couple of adjustments with the needle-valve to find a new setting for running the engine without water being injected into the lower unit. It was necessary to open the needle-valve almost a complete turn.

Two situations were immediately evident. The boat was faster because the engine was turning more rpms and it was louder. The use of water in the lower unit provided a sound level of 89 db. Without water being injected into the lower unit, the sound level was around 94-95 db. These sound checks were made with the boat running approximately fifty feet away from the db meter.



Note the use of a piece of foam to elevate the fuel tank to insure better fuel draw. Du-Bro Solid Linkage kit used for steering control.



The K&B 13cc outboard pushes the author's Dumas Sprint 7.5.

I'm looking forward to having the opportunity to race my K&B 13cc Outboard against some of the 11cc outboards in our region. I was also pleased the Dumas Sprint 7.5 worked so well with the heavier 113cc engine. From reports I've received from others running this outboard, the engine seems to be working fine on boats previously run with the 11cc engine. Although I don't plan to run a tuned pipe on this 13cc engine, there is no question such a modification would increase the power. Tuned pipes that work on the 11cc should work on the 13cc. For those of us who love model outboards, K&B Manufacturing has provided us with "Big Mama." •

A CLOSE LOOK OUTSIDE HARBOR BOATS

BY JOE E. BROWN

If you are a modeler who has a growing interest in towboats, push boats, or "push tugs" as some call them, then sit back, kick your shoes off, prop your feet up, and put on your favorite ball cap. We're going to go aboard some harbor boats and take a look at what we'll find on deck.

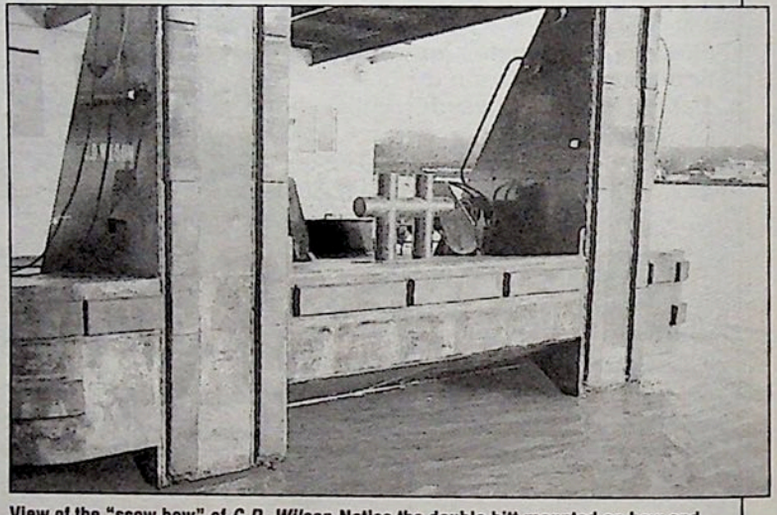
In the summer issue of *USB&SM* we went aboard the *Tristan B* and *C.D. Wilson* to look at the inner workings of a harbor work boat. I had lots of response from fellow modelers, and everyone said they had learned something. I have been asked, first of all, "What is the proper name of these boats and where does the name "Towboat" come from because the boats push their loads?"

Well, it's like this. The proper name for these vessels is "Push Boat"—though people who are familiar with these boats call them towboats. Now, how did the term "towboat" come about? From way back around the turn of the century when they first started lashing flatboats, log rafts, or whatever together to make one unit, called a "tow", to a boat, is where it all began. The term "towboat" does not refer to how the vessel operates. It's a general term referring to the motorized unit of the tow, hence the "Towboat." Now that that's settled, let's go aboard one.

Every harbor boat is equipped with the following items; winches (two), controls for winches mounted on forward bulkhead of main cabin or on the winch, shore power connection (usually mounted on forward bulkhead of main cabin), spotlights (usually two), a radar, kevels (usually six minimum), a double bitt on the bow (some have one on the stern), roller chocks (two), flood lights (varies, though usually six), navigation lights, light boat lights, horn and horn light, fuel fill, fuel vents, access hatches, air intake vents, exhaust vents, and at least two life rings. If you build a model with all these items, you have an accurate reproduction of a harbor towboat.

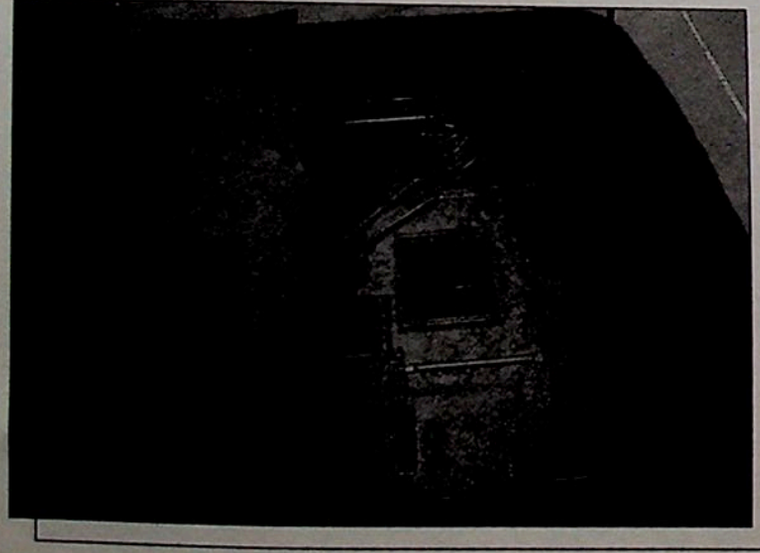
The first thing a person probably notices when looking at a harbor boat is the push knees. Here again the ol' slang word applies with most people calling them tow knees. When a harbor boat is running "light boat" (without a tow) the push knees kind of stand out, especially on a small boat. They can range anywhere from 18 to 36 inches wide and are usually 8 feet high. Remember we are talking about harbor boats here. Larger boats have larger push knees. On the C.D. Wilson, the push knees measure 36" wide by 8' high. Normally a vessel this size (56' X 22') usually has

The *Franklin B* was the first harbor boat to use Cat D353's for main engines.

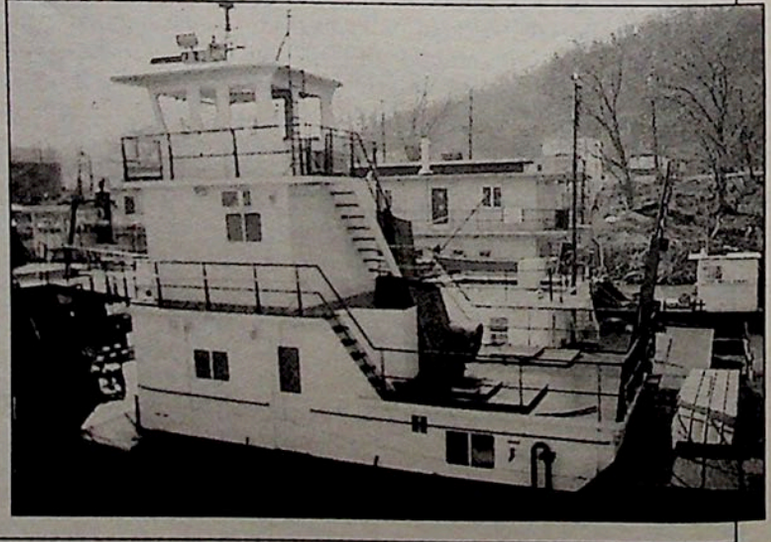


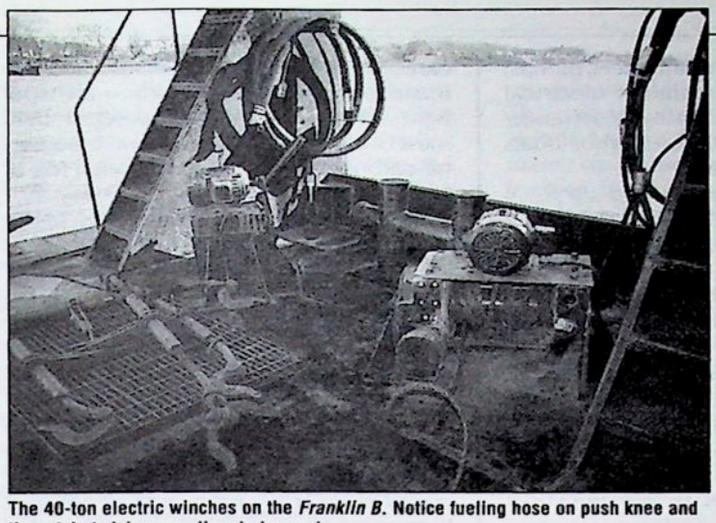
View of the "scow bow" of *C.D. Wilson*. Notice the double bitt mounted on bow and the unusually wide push knees for this smaller harbor boat.

Access hatch for the port steering and flanking rudders of *Franklin B*. Notice access to hold beneath. Depth to bottom of hold here is approximately waist deep at access hole.

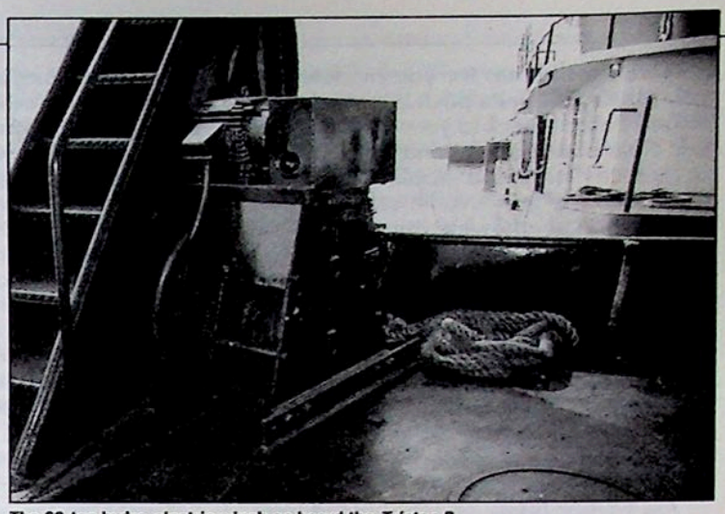


Port view of *C.D. Wilson*. Here you can see the hatches on the engine access hatches used for extra ventilation. The stack houses the generator's exhaust while main engine exhausts go straight out the stern.

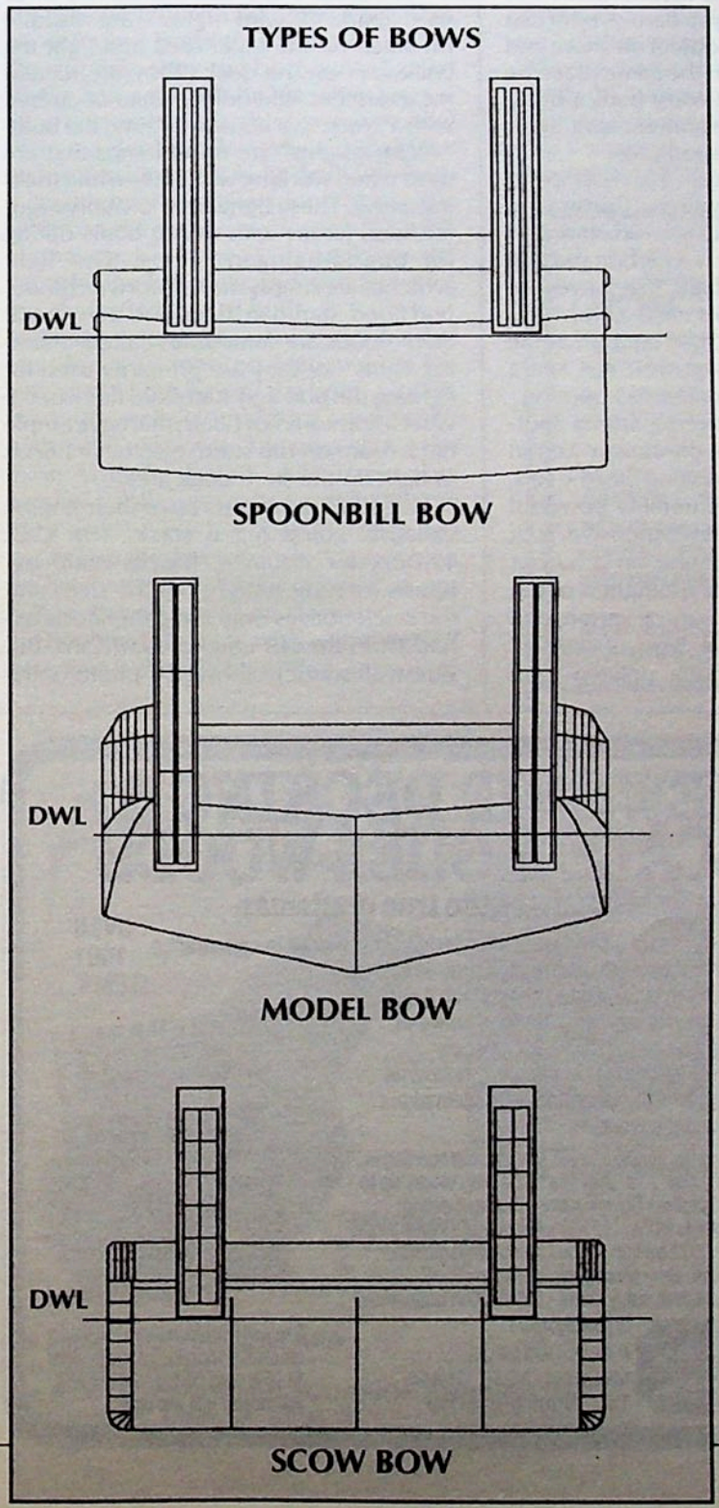


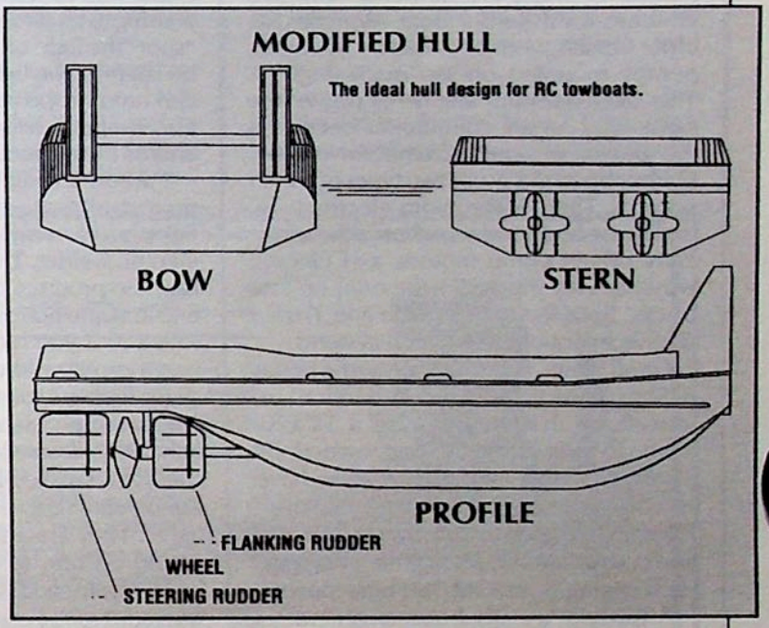


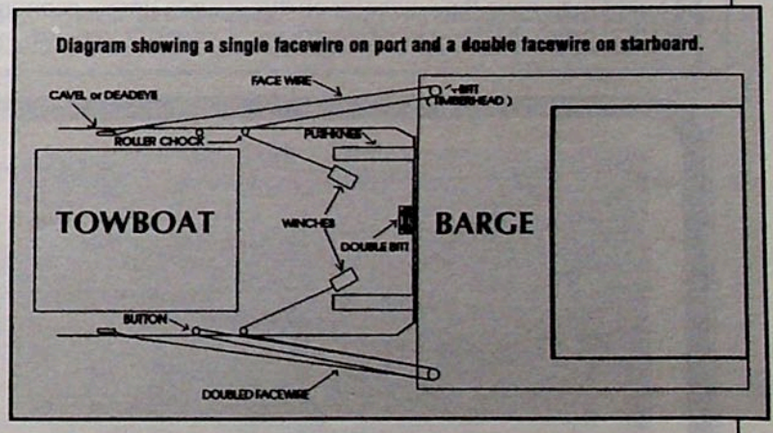
The 40-ton electric winches on the *Franklin B*. Notice fueling hose on push knee and the ratchets lying on a line drying rack.



The 60-ton hydra-electric winch on board the *Tristan B*.







20- to 26-inch wide push knees.

Most all harbor boats have a catwalk going from the second deck out to one of the push knees. A more modern, and practical, setup is running a grid deck, called a fleet deck, between both push knees all the way back to the second deck. As viewed in the photos of the summer issue of *USB&SM*, you can see how ratchet binders and lines are placed on the fleet deck. The rigging, lines, ratchet binders and other items seen lying around the deck are known as "deck jewelry." You might think it odd to have them stacked up there, but when the towboat faces up to an empty barge, the deck of the barge is practically level with the fleet deck.

Here's a little tip for you modelers. If you plan to model a push boat and want to build a fleet deck to your push knees, I use clear plastic sheets and score lines to acquire a "steel grid" look. I then flow paint into the grooves, let set for a little while, then gently wipe the paint off the sheet leaving the paint down in the grooves. It looks really good. For realism, mount the grid where the slots are running forward-to-aft. The reason for this is to enable the pilot to "see" down through the grid at the bow. When the grid slots are placed port-to-starboard the grid looks like a solid deck from the pilots angle of view, which prevents him from being able to see the bow of the boat.

On harbor boats, winches range from 20- to 60-ton capacity with 40-ton being the norm. There are normally only two winches on a harbor boat. Winches on older vessels were operated by hydraulic pumps mounted on the main engines. This decreases the engine of power the same way an air conditioner decreases the power of your automobile engine. Harbor boats today use two types of winch systems. There is the hydra-electric type, which are hydraulic winches with electrically driven pump motors, and electric winches very much like the ones on tow trucks. Both the *C.D. Wilson* and *Tristan B* have hydra-electric winch systems.

Frank Boggs, president of Merdie Boggs & Sons Towing and Harbor Service, informed me that the *Mark M*, a 55'x20' towboat built in 1959 and owned by Boggs, was the first harbor boat to have electric winches in. Her sister ship, *Franklin B*, was the first harbor boat to use two caterpillar D353's for main engines. Each engine is rated at 360 horsepower.

A towboat usually has two generators on board to provide the power for all the electrical needs. It takes a lot of electricity for all those lights, air conditioners, pumps, winches, and other common electrical appliances used in the galley. Most range/ovens are also electric on harbor boats equipped with a galley.

When a harbor boat is tied up for a while, there is usually a shore power connection that enables the boat to shut down the generators, but keep the lights, pumps, and other electrical equipment operational. The boat gets its power through a power cord run from an electrical power source on shore much like an RV hookup at a campsite. But, unlike the hookups for RV's, the shore power connection for a harbor boat is a much larger cable carrying 208 to 480 volts.

Spotlights are used to see long distances at night. They are also useful when a tow has to stop at a location, such as waiting to lock through a dam. A pilot can "spot" the light on an object on shore and by keeping the light in the same place he can hold his position. Most harbor boats are equipped with carbon-arc spot lights and/or incandescent spotlights.

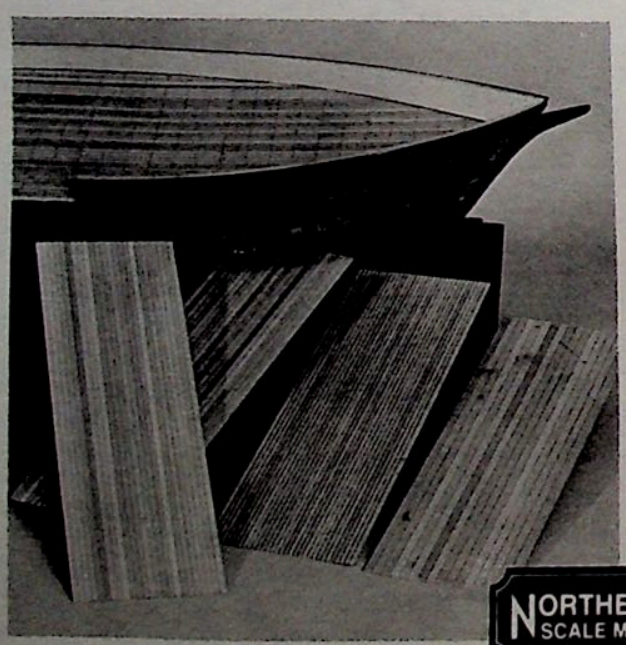
Carbon-arc lights are the most common on all types of towboats. Carbon-arc lights work much like the arc from an electric welder. There is a carbon rod that burns to produce the light. If you ever see one at night, notice how it has a bluish tint to it and if you look close enough at the beam crossing the river, you can see a slight flicker caused by the rod burning.

Please don't look directly into a spotlight. A carbon-arc or the newer Xenon spotlights can be like looking into the sun. Xenon spotlights are extremely powerful lights. They are also very expensive, so it would be rare to find one on a harbor boat. The incandescent spotlight is not as powerful as the carbon-arc or xenon, and is a more economical type of light. It doesn't require as much upkeep as a carbon-arc. Some harbor boats have one incandescent and one carbon-arc spot light. They use the incandescent light most of the time and use the more powerful carbon-arc light to cut through fog or to see farther.

Aside from the typical navigation lights, a towboat has many specialized lights. There is the horn light, which is an amber light that comes on with the sounding of the horn. It is usually mounted atop or near the horns on the roof. There is a clear light mounted atop the front of the pilot house and one atop a jackstaff mounted midships. These are used as light-boat lights which signal that the boat is under way without a tow. Line-haul boats that are pushing one barge also use the light-boat lights. The stern of a towboat is identified by two vertical amber lights spaced three feet apart. "Guard lights" are usually mounted on the bulkheads and light the walkways on the deck. They are regular incandescent light bulbs, white or amber, with a protective housing around the bulb.

"Deck lights" are flood lamps that are used when working with lines while making a tow. These lights are normally regular flood lamps with newer boats opting for quartz-halogen lamps. The light switches are simply marked forward flood, port flood, starboard flood and stern flood. Stern floods are sometimes called "flanking lights" for they are primarily used for lighting the port and starboard flank of the vessel. Some harbor boats, that have ample deck room on the stern, also have floods to light up the stern deck area.

Not all harbor boats have their engine exhausts going out a stack. The *C.D. Wilson*, for instance, has its main exhausts running straight out the stern and the stack houses only the generator's exhausts. In the fall issue of *USB&SM*, Bill Zumwalt's article showed a photo of the



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E.W. Thompson. The *E.W. Thompson* has a small stack with the main exhausts running horizontally the full-length of the second deck back to the stern. This harbor boat is a skyscraper type boat and the exhausts really make it unique, sort of like a street rod with side pipes.

If you have ever watched a towboat, you may have noticed the engine room doors are always open. The reason for this is it gets extremely hot in there. Imagine having to work under your car's hood while driving. Even air conditioning wouldn't help much there. Many times those doors will be open in the dead of winter. If you want to model a harbor boat accurately you'll need to have those doors opened. Also you will most likely find an exhaust fan mounted in each of the stacks to help get the heat out.

Something often overlooked on models of harbor boats are the air intakes for the engines. They can be mounted in the stacks or on the bulkheads. They are not very noticeable which is why they are often overlooked. Basically all you'll see on the outside is a 8- to 12- inch hole with a screen over it. Others look like a box sitting on the second deck or on the back of the stack. Other vents include, the vents for the fuel tanks and ventilation for the "holds" (inside of hull).

Access hatches are located in areas that are otherwise inaccessible, such as the hold area at the bow of the boat. A hatch can be a simple manhole or a raised hatch with a hinged cover. The area above the main engines usually has removable hatches to allow a crane to lift an engine out if need be. Harbor boats that have two stacks usually have the stacks mounted on the hatches. When the hatch is unbolted, the crane lifts off stack and all.

Other harbor boats with a single stack have two access hatches that, instead of being bolted down, can be opened to provide ventilation for the engine room. The deck on the stern is usually removable or has large access hatches to allow maintenance and repair of the jockey bars (rudder arms). They need to be lubed regularly. There are at least four hydraulic cylinders, called rams, that need to be serviced also.

The fuel fill for the tanks can be a 4-inch filler tube or a latching 18-inch manhole. Even a harbor boat can carry a lot of fuel oil, up to 10,000 gallons for some boats. Of course a larger line-haul type boat carries at the average 125,000 gallons of fuel oil. You could imagine how long it would take to fill up one of these with a gas hose for your car. Using a 4" hose can take a couple of hours to fill a line-haul boat. Aside from fuel oil, a harbor boat carries several hundred gallons of lube oil and potable water.

Cavels, or kevels, on harbor boats are usually 36 inches long and 9 inches high. Some have larger ones that are 41 inches long. There are usually two to three 36 inch cavels along each guard (side of the boat), and one larger one mounted on the stern. This varies for instance, the cavels on the C.D. *Wilson* are all 41 inches in length.

Most harbor boat have a double bitt mounted on the bow. Most, I have found, are 36 inches high and 36 inches wide with a diameter of 4 inches. Some are as wide as 44 inches and 46 inches high. Roller chocks on vessels with 40-ton winches are usually 8 inches in diameter while the harbor boats with 60-ton winches have 12-inch roller chocks. There is another chock that looks like a roller chock but does not rotate. It is known as a "button." A button is used when doubling a face line. In other words, the cable runs from the winch through the roller chock to the bitt on the barge and back to the boat. Then it goes around the button, to the bitt on the barge again, and back to the boat. The end of the cable has a loop made on it so it can be secured to a cavel or deadeye.

There are four basic hull designs. The simplest is the "scow bow." It is a flat-bottomed hull with a flat rake for the bow.

continued on page 51

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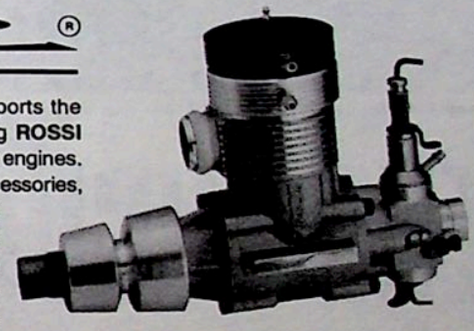

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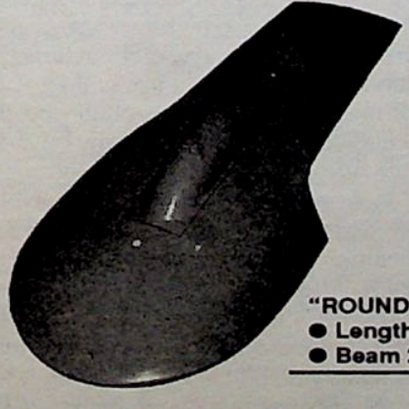

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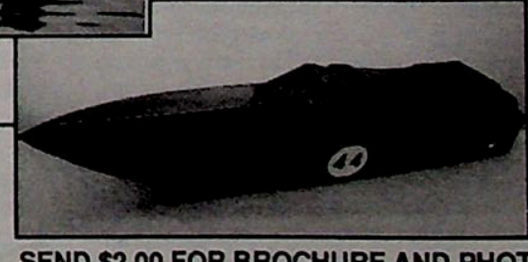

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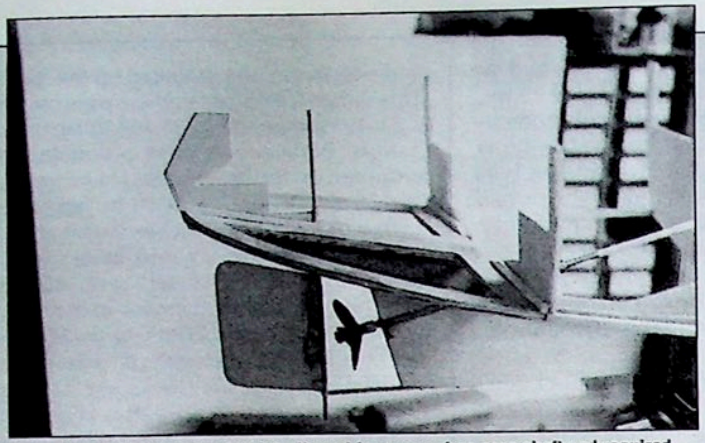
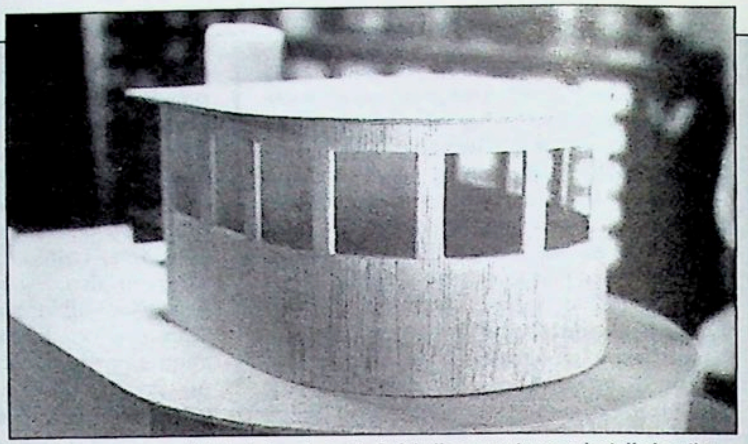
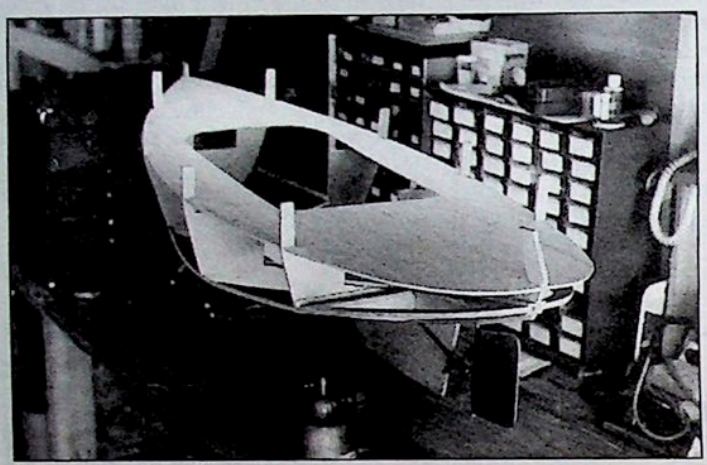


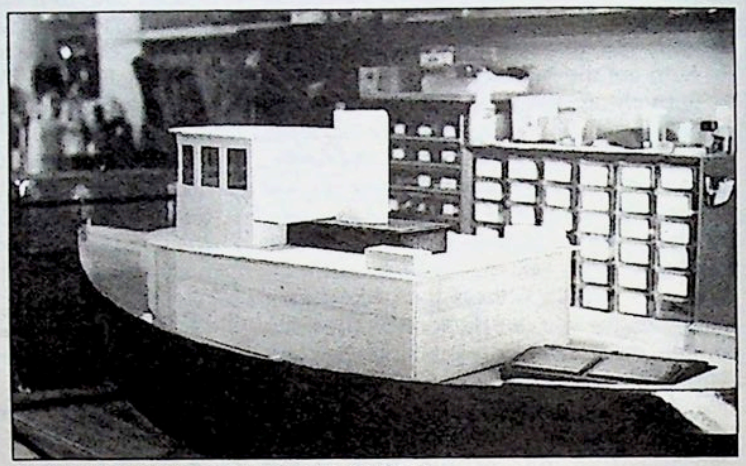
Teflon-lined tubing was used which allowed for a wear-free prop shaft and required no lubrication. Rudder is 1/8-inch aluminum pinned and epoxied to shaft.



Wheelhouse was pre-fabricated and wired. Quick disconnects were installed on the wiring. Hinges in rear allow for removal of wheel and deck house.



Sub deck was cut from 3/16-inch plywood.



Stack base and deck cowling were made of walnut.

THE TUGBOAT WILLIE MAE —FROM SCRATCH

BY LESLIE P. SAUCIER

Since the early days of the Phoenicians, man's passion for boats has proven to be the driving force behind many historical endeavors which date back from the travels of Christopher Columbus to the speed records set by the high speed hull designs of today.

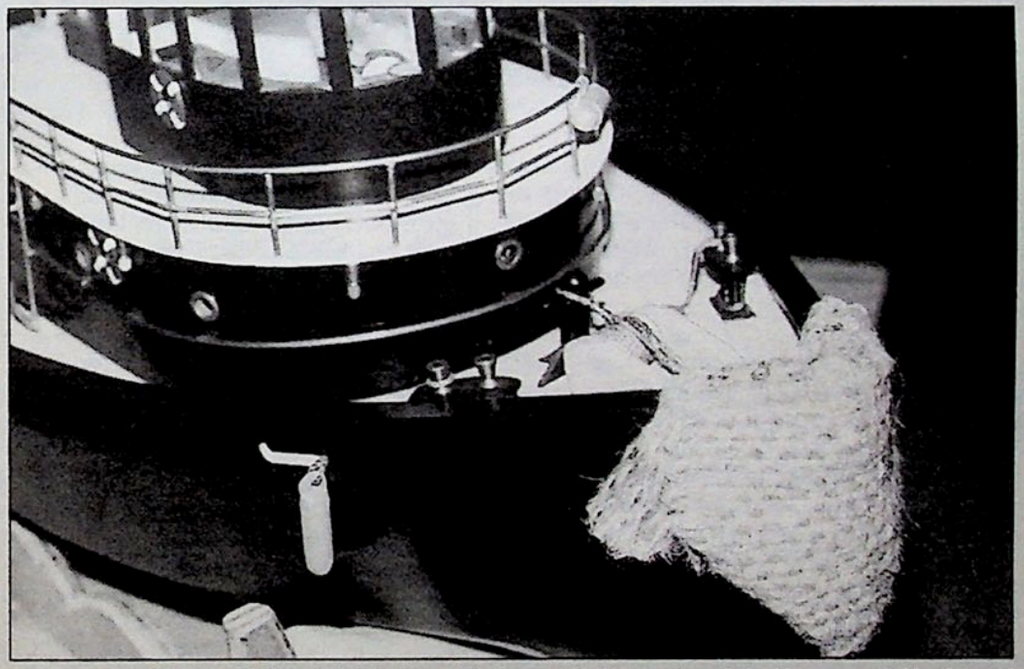
It is not known at what point man first realized that he could separate himself from that strange liquid. There are however, ancient records which show that early boat builders, at some point in time, realized that the performance of their vessels could be improved if they were designed for a specific purpose. Luckily for Cleopatra, her barge was not built from the same set of blueprints as the one carrying grain up and down the Nile. As boat designs continued to change, so did the demands for various types and sizes of boats. After countless years of evolution, a strange and different type of craft began to emerge.

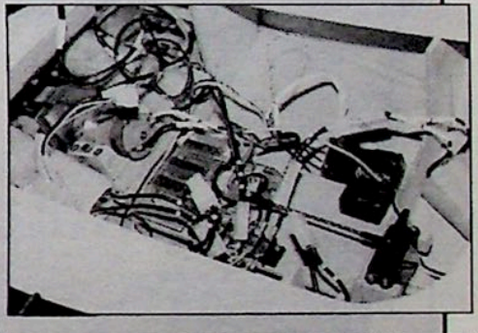
It served purely as a utility vessel as very little consideration was given to cosmetics. It was a workhorse designed for brute strength and maneuverability. It would, after many years, come to be known as a tugboat. To this day, there is no other boat built with a more specialized purpose than that of the Tug. It has stood the test of time as a symbol of the working class and coupled with its power and durability, commands respect in any harbor or ocean.

My affinity for the tugboat goes back to my childhood and times when I was only nine years old, standing in my front yard, dirty knees and nappy headed, watching those work horses go by in the channel which was barely 100 yards from our house. I would go to sleep at night dreaming of being in the wheelhouse with all that power at my fingertips. There were times that I would think this could never happen. After all, I was only four and a half feet high, and most of the skippers I saw seemed much taller. But, thanks to time and Mother Nature, I sprouted and eventually grew up...contrary to my lovely wife's opinion.

I've lost track of how many boats I've built, both models and full size, and how many hours I've spent in the wheelhouse of tugs and crew boats while working on the offshore oil platforms in the Gulf of Mexico. Boats became part of my life and I took them for granted, but a tug always drew my attention wherever I went. The petroleum dilemma of the 70's caused me transfer to Aerospace, where I was assigned to the man in space project. Well, so much for ancient history. I wanted to build what I considered a big model, like maybe a 40-inch hull, but I wanted to build it from scratch, and being over 50 years old, I thought it was about time I got started. But, I didn't want to build just any ol' tugboat. I wanted to build one that occupied a special place in my boyhood memories.

Two weeks later, after a phone call to my dear old mother, I received some pictures which my father had taken of the docks. There was my boat. But, like my memories, the pictures were in black and white and the focus was poor. Home cameras weren't the best in 1949. It was a huge ocean-going tug that was docked near Livingston Ship Yard in Orange, Texas. The Navy yard was close by. I'll never forget its wide beam and the mas-





CLOCKWISE FROM TOP: ■ Hull length is 39 inches, with a beam of 16. Brass motorcycle bushings were used for the port holes. Stanchions and exhaust pipes were turned from brass key stock. All lights and signals are operational. Aircraft mini-bulbs were used throughout. Brazing rod was used for guard and hand rails.■ Speed controller, with custom ballast resistors, are visible in center. Gold dales were used for dependability. Aluminum plate serves to dissipate heat from resistors. Home brew gearbox, visible in far left, is made from gears from a discarded battery operated drill. Not shown is rudder servo linkage with cams installed to activate micro switches, which operate horn and lights.■ Toggle switches were mounted to control power to the various accessories. ■ Pusher pad was woven from multiple pieces of smaller hemp.

sive winches on the fore and aft deck. I can't count the times I tried to look through the portholes to get a better view. I remember being able to see only the galley and dining area. The name of the boat was the *Willie Mae*. Could I duplicate it now, after all these years? Was it worth the time, just to satisfy a nostalgia? I thought it was.

I have never been a scratch builder and I knew it wasn't going to be the proverbial piece of cake. But, having an engineering background, I knew that if I could get it to work on paper, I'd have half the battle licked. Determination would have to do the rest.

My coffee cup and I got up early the next morning and staggered out to my workshop to inventory the supply of balsa. Wondering if I could maintain an acceptable degree of accuracy, I retired to my den and my trusty computer which contained a medium-priced drafting program.

Between the two of us, we came up with a hull length of 39 inches and a beam

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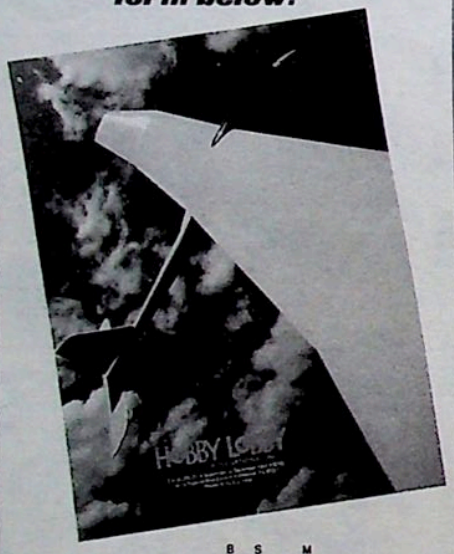

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of 16, which is a ratio slightly wider than normal. It was almost midnight as I watched the shape of the parts slowly emerging from the plotter. I then began to think ahead. I laid out some guidelines and objectives which I hoped to maintain during construction such as

All brightwork must be brass.

All lighting and signaling must be operational.

Bulge and fire pumps would be installed.

As many parts as possible would be purchased locally or handmade.

The next day, considering the plan completed, I went to the local hobby store and purchased a supply of 3/16 plywood and some 1/8 balsa and walked out about $35.00 later.

The keel and frames were sawed from the 3/16 plywood. After epoxying the rudder and prop stuffing tubes in place, I fitted the keel into my homemade jig, which barely accepted the length.

The frames were tacked in their positions before I started installing the keel strips. After some trimming of the strips to get them to fit into the frame cutouts, I realized the frames would not line up without putting the keel and strips in a bind. I had to back up and enlarge the cutouts in the frames to retain an accurate centerline. The chine logs were cut oversized and trimmed down after gluing in place. It was at this point that I decided to do the fairing and found that I had miscalculated the width of the two frames nearest the bow. I had to remove the chine logs and make the corrections. These were problems which would not have been encountered in any kit on the market today.

The faring completed, I cut and installed the 3/16 inch ply sub deck.

Before beginning the hull planking, I cut the patterns from poster paper and trimmed them to fit before tracing them on to the 1/8 balsa.

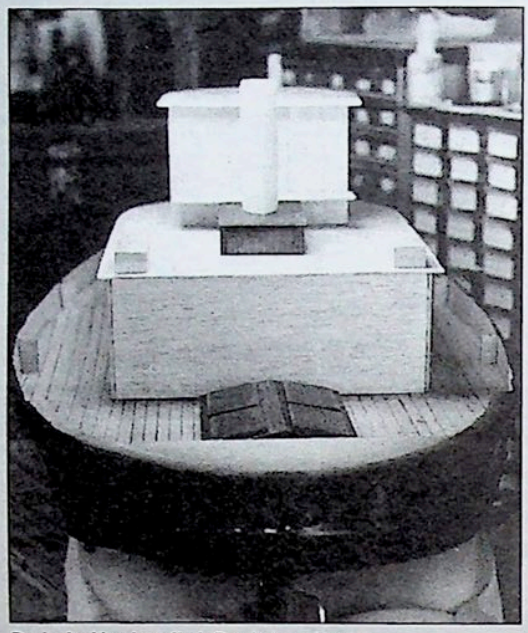
The bottom and side planking went on without incident due to a liberal application of Windex.

After installing the stern seat, I planked the transom area and installed the motor mount and other platforms needed for items which were to be installed later.

When I began planning the deck cut, it occurred to me that this should have been done before planking in order to keep a more accurate frame alignment. After measuring the vertical and horizontal dimensions between the frames I found them to be acceptable (Now that's how I spell relief).

The rail caps were traced from the actual curvature of the rails. They were not installed at this time as I wanted to leave myself an open deck for finishing.

The entire wheelhouse was assembled, wired and painted prior to mounting on pivot pins to allow for future access.



Deck planking installed. Ready for rail caps.

For the rudder assembly, I used a 1/8 shaft pinned and epoxied to a 1/8 diameter aluminum rudder driven by an Airtronics servo. I had to convert to a Futaba connector in order to mate up to the little Novak NER-2X receiver which I had chosen to be the ears of the *Willie Mae*. The lower rudder support was recessed flush with the keel.

A Dumas #13 prop, Stock No. 3111, was used on a 3/16 shaft coupled to a gold bond motor through a Midwest #835 universal joint. I built the gear reduction mechanism using the gears I ripped out of a derelict battery-operated Mikita drill. They gave me the exact reduction I needed.

I had a Novak speed controller in my spare parts pile, but I chose to go with a mechanical one as I needed the linkage to operate a couple of Micro switches. I found a Tamiya #253, which sells for about $13.00. After installation, I ran it for about fifteen minutes at its slowest speed. The resistor heated up, cracked, and fell apart. This gave me a good excuse to install my own resistors, and my own values. I installed about 60 watts of Gold Dale resistors, which was more than adequate to hold up under the load. I mounted them to an aluminum plate for added heat tolerance. The Thunder Tiger mini servo 821/J that was to be used to drive the controller looked somewhat malnourished, but it proved to have more muscle than I expected.

Due to the absence of a layout sheet found in most kits, the geometry involved in locating the various components for throttle and rudder movement required careful and time-consuming planning.

I installed Micro Switch actuators in the throttle and rudder linkages to activate the

horn, whistle and fire pump. In order to operate the fire pump, one only has to back off the throttle, give it right half rudder, and guess what, the fire pump starts up. The same setup for the horn happens with left half rudder. This arrangement, when wired properly, is like getting three or four channels from your two-channel receiver.

All hand and guard rails are made from 1/8 brazing rod. Mast, passageway and navigation lights are 3/16-inch diameter miniature lamps. In the event that maintenance is required, Winchester plugs provide a quick disconnect method to completely remove the motor and electronics platform.

The on-deck fire fighting equipment was meticulously carved from balsa. The horn is an electronic module driving a three-inch speaker. The engine compartment cover is walnut flavored hardwood.

For those of you interested in cost, I spent about $75.00, out of pocket, on wood, CA and paint. Plus whatever value you wish to place on used receivers, controllers and servos. Most of the cost reduction was due to a liberal spare parts drawer which produced such items as brass key stock and miniature lights.

After plodding through all the problems normally solved for you at the factory, before you even open the box, the *Willie Mae* was ready for sea trials. It was a typically beautiful Florida morning which found me on the bank of my favorite lake prepping the Willie Mae for her maiden voyage. I lowered her into the water and placed some ballast in her hull. After three months of judicious effort I was ready at last. I checked out the entire system and touched the throttle. She responded with a slower than slow speed which was just what I wanted. I found full speed to be a little too full. It was obvious that I would have to change the value of the third resistor on the speed control module.

During a series of figure 8's, I noticed that she turned a little sharper to port than to starboard. After a twenty-minute run, I brought her about and headed for the shore. As I watched the bow moving towards me, I began to ask myself if it was worth the 60% increase in time and labor. What did I gain? Was it satisfaction? A sense of accomplishment? Yes, that and more. I was able to build a memory, something which I could previously see only in my mind. But, did I build a better model? Considering the fact that it took me four times longer to build, with virtually the same components as found in a kit, I don't think so.

I'd like to take this opportunity to tip my hat to the kit manufacturers. Their efforts to produce a high quality product and continue to remain competitive, can only be fully realized by going it on your own. The preparations made by them will save you many hours of designing, sawing, sanding, cutting and cursing. And at the same time, allow you a generous amount of latitude to be creative and still personalize and complete your model. The biggest advantage is that you will not be required to spend sleepless nights thinking about how you're going to get around a problem you created.

If the model you wish to build is not available in kit form, you have to ask yourself if you are willing to put forth the extra time and effort required.

If you still have the itch, scratch it, and decide for yourself.

Will I ever build another from the ground up? I think not. •

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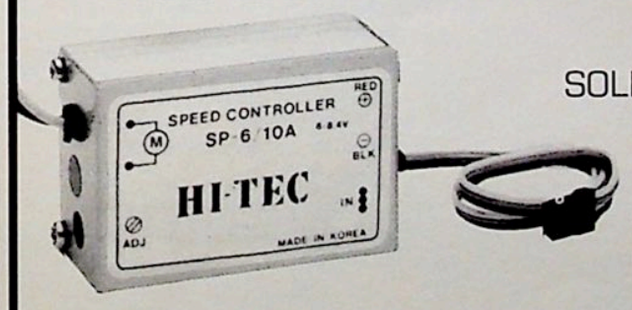

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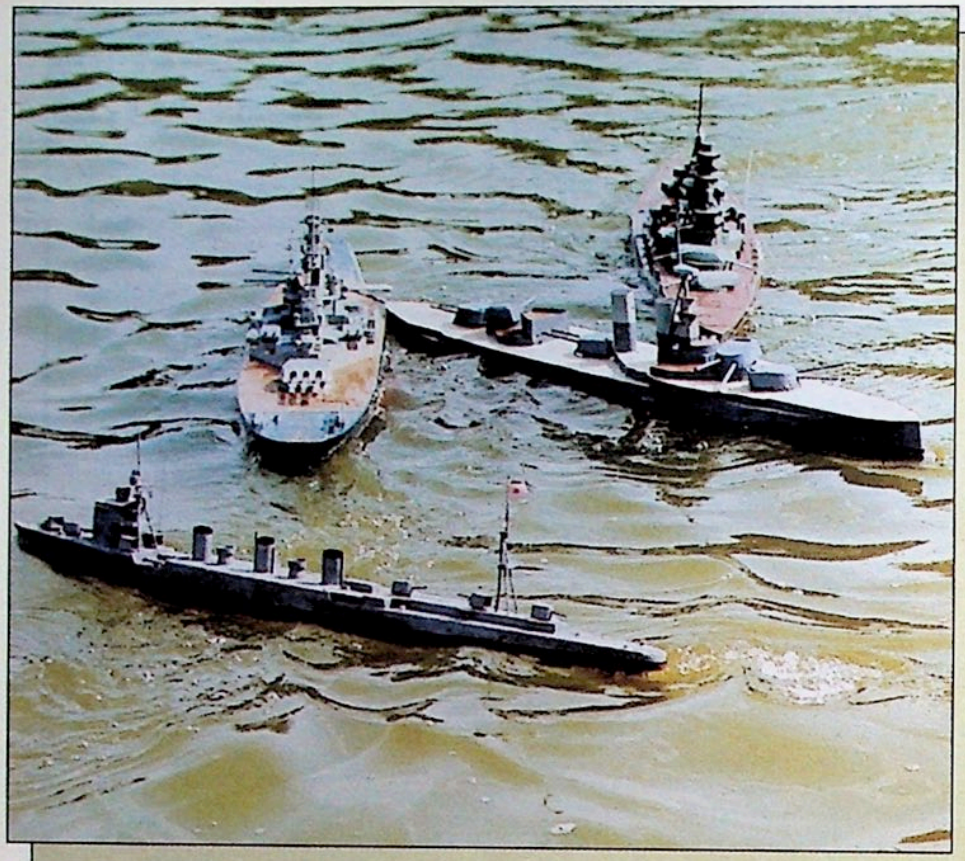
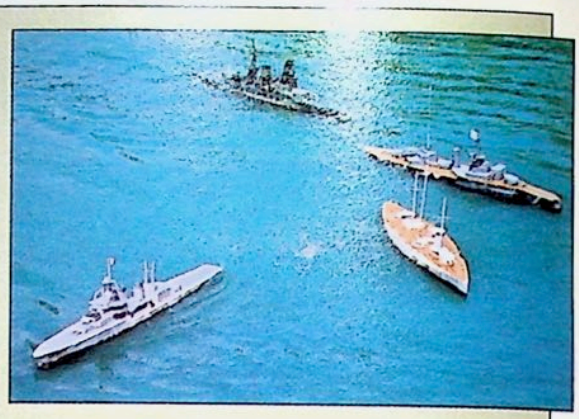
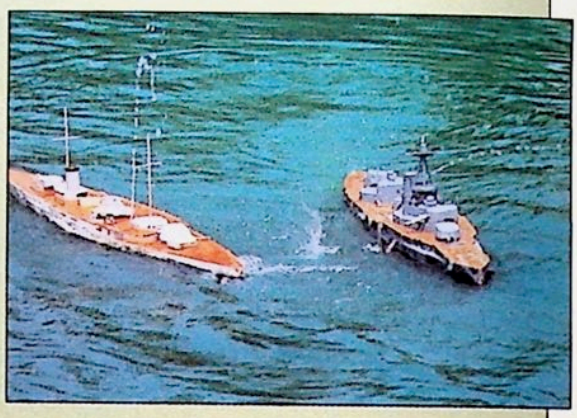
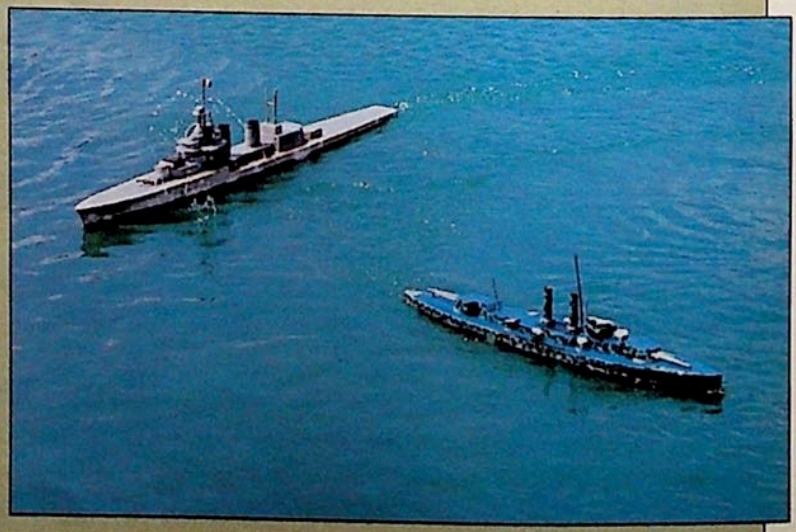






CLOCKWISE FROM TOP LEFT: ■ Melee! Left to right: Japanese light cruiser *IJN Kitikami*, American battleship *USS Indiana*, British battleship *HMS Iron Duke*, and Japanese battleship *IJN Nagato*. ■ Fleet battle, front to back, French light cruiser *La Galisionaire*, German battle cruiser *SMS Moltke*, British battleship *HMS Marlborough*, Japanese battleship *IJN Nagato*, and in background, Swedish battleship *Sverige*. Note vertical water stream from bilge pump of *Moltke*. ■ *SMS Moltke* and *HMS Marlborough* slug it out. Both ships are pumping. Note BB splash between ships, the *Marlborough*'s "B" turret has attempted a shot at the *Moltke*. ■ French light cruiser *La Galisionaire* (Capt. Mike Deskin) and Swedish coastal defense battleship *Sverige* (Capt. James Foster). Note residual BB splash droplets directly under the French ships forward turrets. The *Sverige* has just made a waterline hit with its stern cannon. ■ Countdown... two minutes to battle. Captains pull safety pins, turn on radios, check all systems, and launch their warships. ■ The '93 Nationals in Houston, some of the ships ready to battle. Here can be seen, top of table, HMS Valiant, USS Indiana; bench, HMS Warspite, USS Pennsylvania, DKM Bismarck, USS Washington; and, ground, another DKM Bismarck.



FACT & Fantasy ABOUT RC WARSHIP COMBAT

BY STEVEN MILHOLLAND

The hobby of R/C Model Warship Combat is such a recent innovation that very few people have ever even heard of it. Over the last 13 years I have had a lot of "first time" opportunities to discuss the subject of RC Model Warship Combat with friends and strangers alike. The thing that never ceases to amaze me is the reactions I get when they learn that I build battling radio-controlled model cruisers and battleships.

The first comeback, especially if the person knows absolutely nothing about ships or modeling, is usually, "where do you have your races?" I then explain that the ship models I build are not speedboats and they do not race, they battle each other with onboard BB cannons. At that point the conversation is likely to go somewhat like this:

"They really do battle? That's so neat! How do you know who wins?"

"The loser is the one with the most number of holes," I say.

"Holes? You mean they actually shoot HOLES in each other?" they reply in astonishment and disbelief.

"Yes, they do. The hulls are sheeted with very thin, soft balsa wood so that BBs can go through and water can come in."

"Well, what if it starts to sink?"

"That's the whole idea, to shoot enough holes in the other guy's ship to sink it. Then the winner gets a lot more points."

Still disbelief, "You actually *allow* them to *sink*? What do you do then? How do you get your model back?"

"Strip to my skivvies, jump into the water and go get it."

At this point the person will usually be convinced that I am a total loon or begin to realize that I am indeed serious (maybe both). The conversation can then take many different turns depending on where they are coming from. Are they mildly interested only in an intellectual sense, are they not at all interested (only being polite for my sake), or regardless of background, are they so fascinated they have to know more and know it *now*.

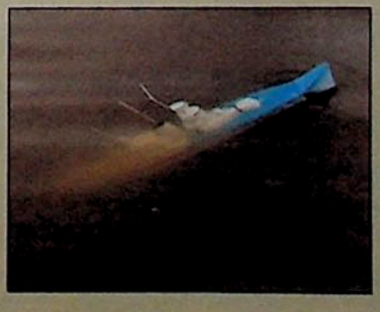
What follows is a series of misconceptions and questions about this "Magnificent Obsession" that I have run into over the years. Some are like that above, from someone totally ignorant of the hobby, others are voiced by long time RC people who are just not familiar with this particular sport, and some are still held by rookies even after some direct battling experience. I will try to shed some light based on the vast amount of experience I have accumulated in this sport since 1980 (how's that for tooting my own horn).

I also would like to make note here that my experience is based on involvement with the oldest, largest and most widespread of the Warship Combat groups, the International RC Warship Combat Club. This is the club formed by Stan Watkins (the father of RC Combat and inventor of the first successful RC BB cannon) and others in Amarillo, Texas way back in 1978. The club has members and local groups in almost every state from Texas to Maine, from Minnesota to Florida, some states to the West, and in Canada. While there are other groups who battle somewhat differently, 95% of all the battling that I have seen, read about, or heard about that has taken place East of the Rockies is based on the same basic style of ship construction and battling rules used by the IRCWCC. (Note: while this does indeed hold true East of the Rockies, there is a fine bunch of fellows in Southern California who have formed a group based on what they call Big Gun Warship Combat. Ship construction and battling style is radically different from what I am familiar with. I would suggest you contact John C. White, 13341 Beach Terrace Dr., Garden Grove, CA 92644—he has featured the West Coast style in several issues of *USB&SM*.

Here goes with the questions and misconceptions.

Question: "How do you find your ship when it sinks?" There are usually plenty of bubbles coming up from the model to aid recovery. When a ship sinks, the battle is temporarily halted while the captain retrieves the model. Only after he is back on dry land does the battle resume. Battles are usually held in very shallow water—no more than two to five feet deep. There have

■ **TOP: SINK! Capt. Don Cole's *USS Alabama* goes down by the bow at the 1992 Nats in Orlando. German battle cruiser *SMS Derflinger* and Japanese battle cruiser *IJN Hei* make victory passes by the sinking vessel. ■ LEFT: Recovering a sunken model after a one-on-one battle. Francis Rogowski's *SMS Lutzow* vanquished by Liel Goodson's *SMS Moltke*, in foreground. ■ BELOW LEFT: SINK! The Chinese light cruiser *Ning Hai* goes down stern first. ■ BELOW RIGHT: Japanese battle cruiser *IJN Haruna*, built by Capt. David Haynes, shows fine level of construction without excessive detail. This is typical of most combat models.**



been occasions when battles were held in deeper water, but this can be accounted for by sailing an obviously sinking ship into the shallower areas for easier recovery.

Question: "Has anyone ever lost a sunken model?" In all my years of involvement I have only heard of one model loss. This occurred in just a few feet of water at a contest in Orlando, Florida a few years ago. It is not known if this model simply submarined a long distance away from the actual sink point or was eaten by an alligator. A six-hour search by several battlers revealed nothing. Again, this is a one and only incident, warship models can sink but they cannot crash or do cartwheels across the pond. Compare this with the damages or losses incurred at the typical RC speedboat race or RC airplane contest.

Myth: "It must be terribly time consuming to be constantly rebuilding your model." Truth: Nothing is ever really destroyed on these models, just holed by BBs. The thin skin of the models are penetrated but the mechanics are not damaged. Patching battle damage is quickly and cheaply done right at lakeside with nothing more than small pieces of Silkspan and the same dope used to color the hull. The Silkspan patch is laid over a hole and a layer of dope is brushed on. This immediately seals and waterproofs the hole. Many holes can be patched in just a very few minutes and a ship is again ready to battle.

Misconception: "I wouldn't spend all that time and money to build a beautiful model and then let some guy destroy it!" Truth: Neither would I. This is a lack of grasping the true concept here. If you build a beautiful model and expect it to stay looking pristine, it is not built for combat. They are built from the keel up to BATTLE, just as the real ships were. Battlers differ in the amount of detail they will put on a combat warship but that is personal preference, they all expect their model to be holed by BBs and sunk time and again.

Myth: "Getting water inside the model must damage the equipment". Truth: Contrary to what people think, fresh water will not harm most equipment. The Gel-cell batteries, BB cannons, and drive and pump motors are not damaged even after numerous immersions. The radio and servos are installed inside a waterproof and BB-proof box to protect them from being shorted out by water. But even if a radio is shorted, it is seldom damaged—just opened, air dried, reassembled and used.

Myth: "This must be very expensive to get into." Answer: Getting involved in this hobby is no more expensive than any other RC sport. We use the same basic materials, tools, radios and hobbyist know-how that every other RC sport uses. Operating expenses are cheaper than most glow engine planes or boats. BBs and CO_2 are very inexpensive and patching materials cost, as described above, are miniscule.

Question: "How do the BB cannons work? How many times per sortie can they shoot?" CO_2 gas supplies the force to fire the BBs. This is carried in a small refillable bottle or comes from disposable cartridges. Magazine capacities are determined by rules according to ship type. It ranges from about 10 per gun to 75 per gun.

Question: "Can I build a submarine/PT boat/aircraft carrier?" I have lumped these together because they get similar answers. In order to compete, a ship must be built to 1/144 scale or 1 inch equals 12 feet. This gives a good size and weight range for most of the cruisers and battleships that were built from 1906-1946, the era specified in IRCWCC rules. The smallest of the cruisers is approximately 35 inches long and weighs three or four pounds. The largest of the battleships is approximately 74 inches long and 6 pounds.

On the other hand, the largest sub in existence during WWII in 1/144 scale is only about 36 inches long and weighs less than three pounds. Building one of the small cruisers of that size for surface combat is tough enough, building a submerging vessel the same size is almost impossible. Subs have been built by those determined few who just had to have a sub, but they have never been competitive. The mechanical difficulties inherent with a sub in that small scale and their very low offensive capability make them more an oddity in this sport than anything really playable.

PT boats are too small—period. An 80-ft. Elco PT in 1/144 scale is only 6.66 inches long. Forget it. Note: Combat PT boat models are becoming available in 1/32 scale but they are strictly for PT versus PT, they will not be allowed to battle the 1/144 scale warships at sanctioned meets.

Aircraft carriers were not made for surface combat. Their offense was their air complement; most carried only anti-aircraft weapons for ship defense. Even if carrier models were allowed to carry suitable BB cannons, their immense size, target area and lack of maneuverability makes them very non-competitive on the water. In real life, in the only instances where aircraft carriers ever came within gun range of enemy surface warships, the carriers lost. End of story.

Question: How do battles take place? Is it every Captain/ship for himself?" Traditionally, there are two fleets that battle against each other, the Allies (America, Britain, France) against the Axis (Germany, Japan, Italy). This is adhered to at Nationals Championships but at smaller regionals and club events the breakup of ships nationalities sometimes does not allow this if fair battles are to result. Competitors will nominate and elect two fleet Admirals and the Admirals will equally divide the ships present based on ship type and captain's experience.

Myth: "How do you aim the cannons? BB cannons are aimed by aiming the ship. Some ships are restricted to cannons shooting directly off of the bow and stern, others are allowed to shoot off of all sides of the model. For ranging the target, cannons are preset to impact the water at a specific distance depending on the Captain's battling preference. Ships are steered to bring the cannons to bear on an

continued on page 54

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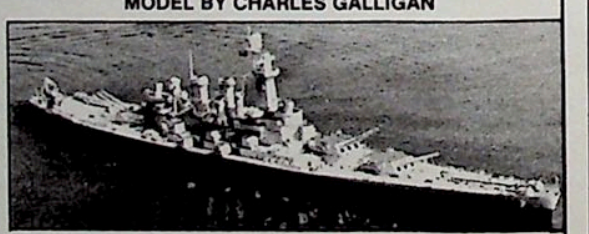

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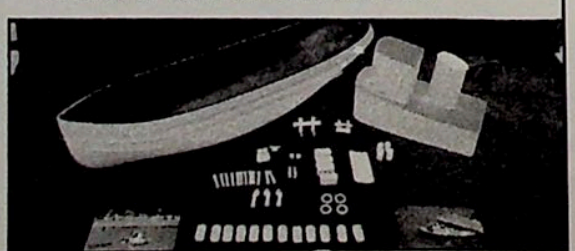

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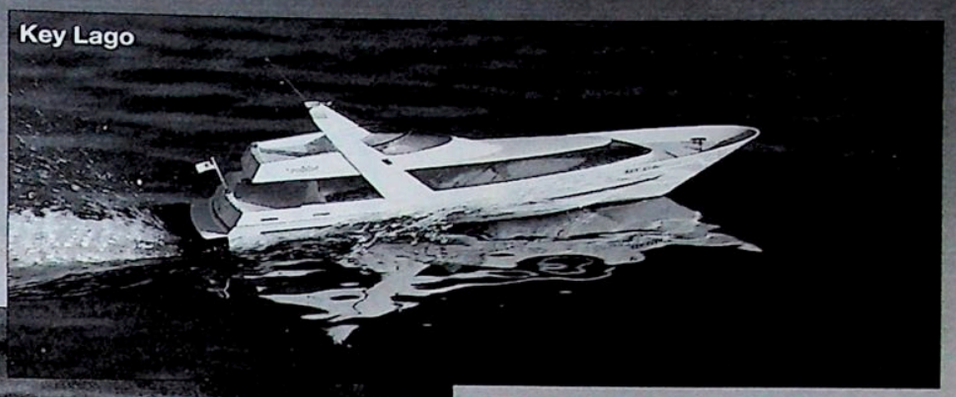

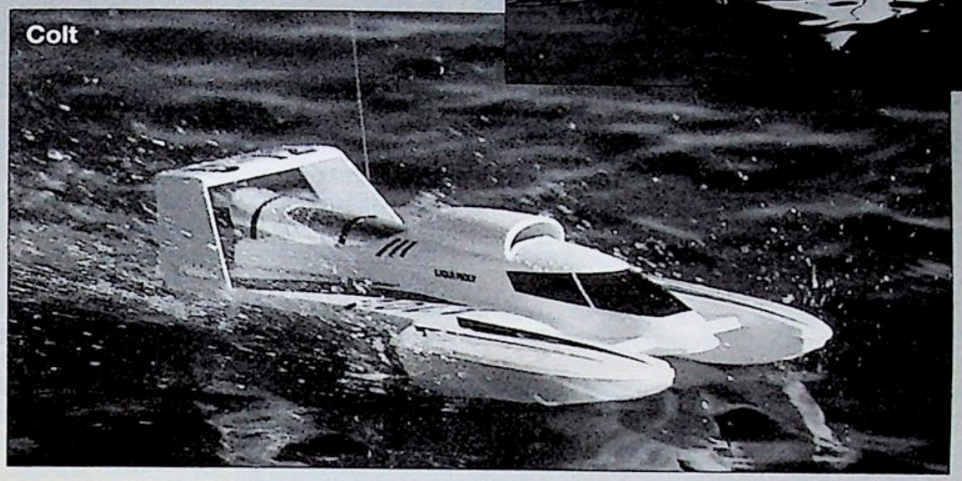

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product survey

BY JERRY DUNLAP

1/4 SCALE CRACKERBOX BY AMAZON BOATS

The popularity the 1/4-Scale Crackerbox is enjoying an interesting development in model boating. Without question, the design of the Crackerbox is a giant step backward in hull development and technology. The original Crackerbox made its appearance back around 1948 or '49 as a 16-foot plywood runabout powered by Ford and Mercury flathead V-8 engines. The Crackerbox Class is one of the oldest classes raced in the Inboard category of the American Power Boat Association. The flathead V-8 of the '4Os and '5Os has been replaced by small block Chevy 305 engines. A majority of the boats racing in the class are fiberglass rather than plywood.

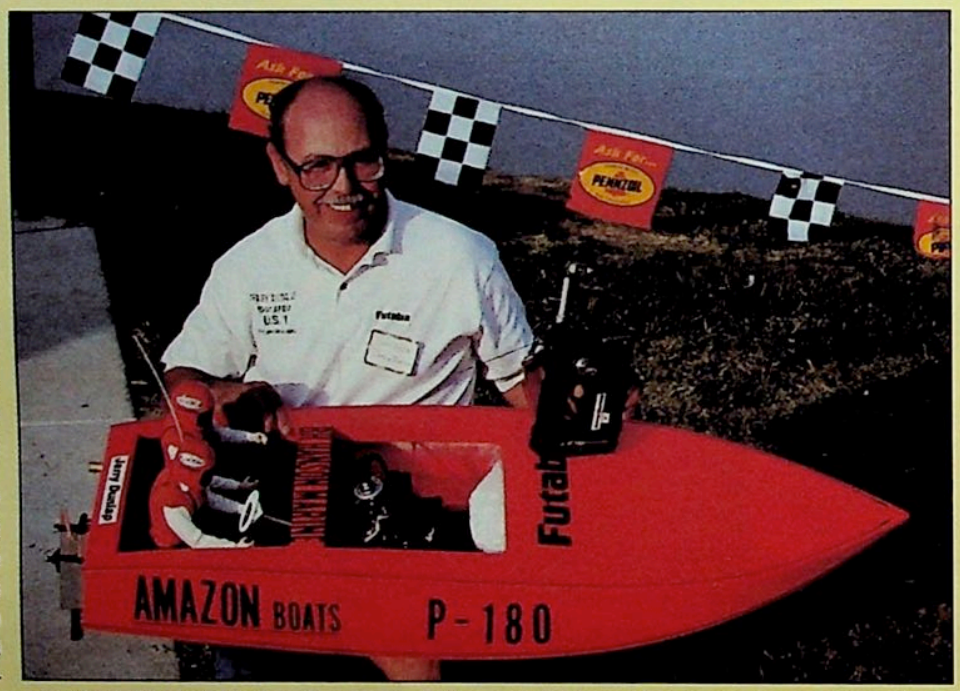
My motivation for creating a four-foot plywood model of the Crackerbox was mostly an interest in building a "nostalgia model" capable of being powered by a gasoline "line-trimmer" type engine. I was looking for an easy-to-build, scale-appearing boat. The Crackerbox made an ideal choice. I cannot take credit for developing the first 1/4-Scale Crackerbox. Jeff Schmidt, of JVS Boats, came out with a fiberglass 46-inch version about a year before I made my wooden Crackerbox in the summer of 1992.

I took my wooden Crackerbox to the 1992 Las Vegas Gasoline Grand Prix and it really created a great amount of interest. The boat was judged Best of Scale in the A Mono Class and ended up fourth overall in racing competition, even though it raced against deep vees. It was at that event that Gary Johnson, past NAMBA president, and I got to talking about the idea of creating a 1/4-Scale Crackerbox Class. There definitely appeared to be a tremendous amount of enthusiasm from others attending the Grand Prix.

Working together with Gary, we developed a provisional set of class rules. Glen and Stormi Paykoff, Event Directors, agreed to make the 1/4-Scale Crackerbox Class an official event at the 1993 Las Vegas event—and 15 Quarter-Scale Crackerboxes were entered. First place was taken by Jim Auguston of Bellingham, Washington, driving a plywood hull he built. Second place went to Dennis Hoover of Lakewood, California, racing a fiberglass hull he had made; I won third place with an Amazon Boats Crackerbox; and Bill Cain of Anaheim, California, was fourth in a JVS Crackerbox.

As this article is written, there is a formal proposal before the APBA Model Boat Category to adopt a 1/4-Scale Crackerbox Class under its gasoline racing category. Similar proposals are being considered by both the other national model boating organizations.

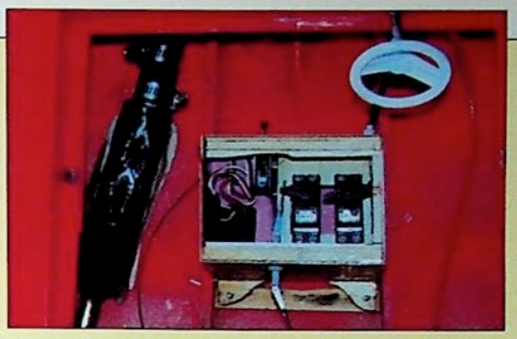
The Crackerbox by Amazon Boats is a fiberglass version of the boat I scaled down and built. Although they were under no obligation to do so, Amazon Boats contacted me and requested permission to mold a fiberglass Crackerbox based on my plans. After explaining I didn't design the Crackerbox, only adapted it for use as a model, I encouraged them to make a fiberglass version. I even offered to race their fiberglass boat at the 1993 Las Vegas race.



Jerry Dunlap at the 1993 Las Vegas Gasoline Grand Prix, where the Amazon Boats Crackerbox placed in the the 1/ 4-Scale Crackerbox Class.

I received a Crackerbox from Amazon about three weeks prior to the Las Vegas race. Epoxy/glass construction is featured and the hull and deck are joined. At my request, the 1/4" plywood engine stringers were included, but not installed This would allow me to install my Hanson Zenoah. I determined the location of the engine by basically centering the engine in the middle of the engine compartment. Not exactly scientific, but it seems to work.

With the engine mounted to the rails, the rails were centered and epoxied to the hull. Fiberglass cloth should be epoxied to the hull and rails to insure the rails will stay bonded to the hull. Unless one is fairly experienced with installing engine rails, I would recommend allowing Amazon Boats to install them. Just let Ralph at Amazon know the distance you want



■ LEFT: Shot of the engine and radio compartments. B.H. Hanson Zenoah with water-cooled header and 11cc Magic Muffler■ CENTER: Close-up of the radio box and Futaba radio system. S-9301 servos used for extra power. ■ RIGHT: Octura Models Gasoline Strut and Octura Long Blade Rudder along with a Prather Spin Fin bolted to transom.

between the rails.

Once the engine rails were attached, the stuffing box and strut were installed. An Aeromarine Laminates stuffing box was used and this was connected to an Octura Gasoline Adjustable Strut which was mounted to the transom with the strut depth set one inch from the bottom. The hole for the stuffing box to exit the hull is approximately half the distance between the end of the engine and the front of the strut. I cut a pilot hole in the bottom of the hull and then enlarged this hole until the stuffing box was aligned with the strut. Don't worry if the hole is a little sloppy.

Once the stuffing box is aligned, use plastic tape around the outside of the stuffing box where it exits to the hull to prevent the epoxy from running out the hole. To attach the stuffing box to the hull, cut up some pieces of fiberglass cloth and mix them into the epoxy. Then dab this mixture around the stuffing box working the cloth into the hole in the hull.

An Octura Long Blade Rudder with Water Pickup was mounted to the right side of the strut. I have been running .187 size flex cable on my Crackerboxes and haven't had any problems with twisting cables. I ordered all my running gear through Gary Preusse at G&M Models.

The drop-in turnfin was made from sheet aluminum I cut and formed. The turnfin is shaped like a right triangle. It is 3 " long, 1-1/2" deep with a 3/4" mounting flange. A piece of 1/4" plywood 2"x4" and V-shaped to the contour of the bottom was epoxied to the inside of the hull in the center of the engine compartment. Drill some holes along the keel where the drop-in turnfin will be placed and use a saber saw to cut a slot in the bottom for the turnfin to drop through.

To assist those who might purchase an Amazon Boats Crackerbox, I have written a set of instructions covering engine and hardware installation. Included in these instruction will be templates for ride-plates and turnfin, along with dimensions I used on my boat.

Installing a radio system in a boat this large is really easy. Amazon Boats has a fiberglass radio box that can be used in the Crackerbox. I chose the same radio box I had used in my wooden Crackerbox, as it fit right between the engine stringers. I would recommend the use of high output servos such as the Futaba 9301 for both rudder and throttle control. When operating large gasoline powered model boats, a little extra servo strength is an added benefit.

Being somewhat under the gun to get the boat set up and running in only three weeks, I decided to employ spray cans for the painting process. I've recently begun painting my boats high visibility florescent orange. Flourescent colors are available in spray cans at hardware stores. To bring out a glossy finish, clear is sprayed over the flourescent. In order to really get a bright finish using flourescent colors, the entire hull should first be painted white. The final finish on my boat reflects a "rush job" approach. However, the boat is highly visible on the water.

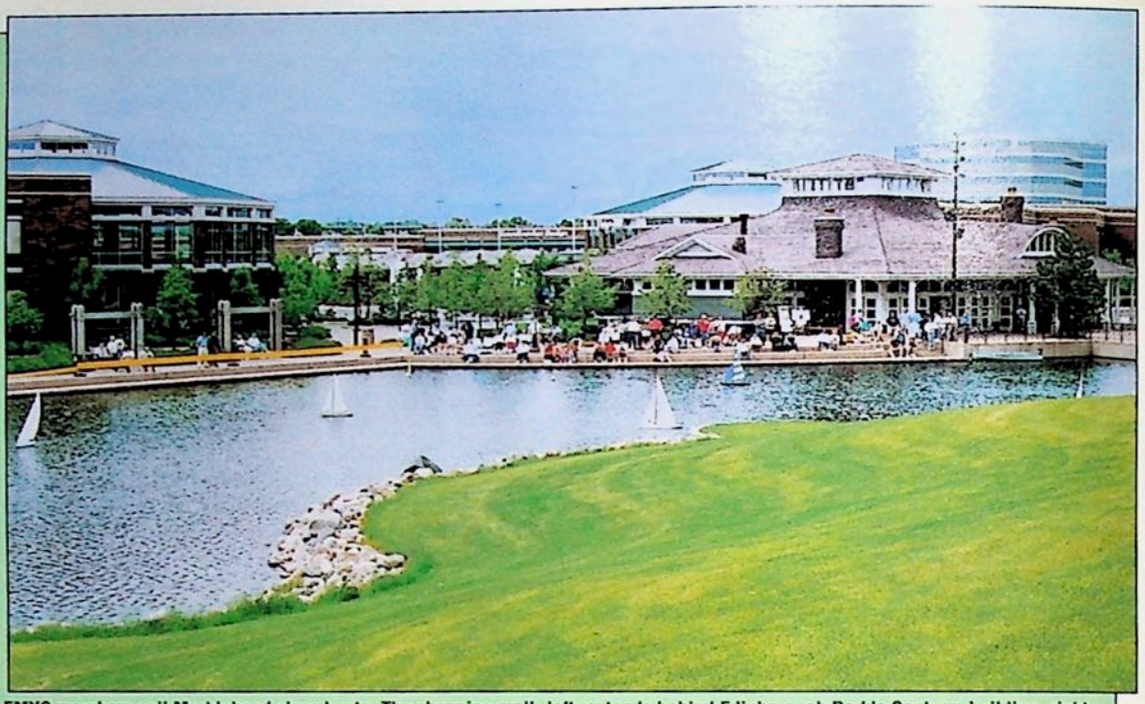
I had an opportunity to run the boat three days before leaving for Las Vegas. The boat worked fine from the first time it was launched. I experimented with a couple of different props and strut depth settings. The best combination seemed to be an Octura X-465 set 1 inch below the keel. With these settings, the boat was placed in its shipping box and we were ready for some serious 1/4-Scale Crackerbox racing.

The Amazon Boats Crackerbox cruising along.

For only running the boat once before entering the Las Vegas race, I was pleased with a third place finish out of 15 Crackerboxes entered. The Amazon Boats Crackerbox handled very well during all three heats. I won my first two heats and placed third in my last heat.

I believe one of the appeals of the 1/4-Scale Crackerbox Class is racing a scale appearing model. Fred Diel Products is an excellent source of items to increase the scale appearance of the Crackerbox. Drivers, life jackets, steering wheels, and instruments are some of the things Fred is making available for the 1/4-Scale Crackerbox enthusiast.

Amazon Boats, P.O. Box 316, Henrietta, NY 14467-0316; (716) 359-8825.
B.H. Hanson Model Marine Products, 7380 S. Eastern Ave., Ste. 124-176, Las Vegas, NV 89123; (702) 896-9471.
Fred Diel Products, 1616 Sydney St., San Luis Obispo, CA 93401; (805) 545-0712.
G&M Models, P.O. Box 6342, Broadview, IL 60153.
Octura Models, 7351 N. Hamlin Ave., Skokie, IL 60076. •



EMYC members sail Marblehead class boats. The shopping mall, left, extends behind Edinborough Park's Centrum building, right. The Centrum building serves as EMYC's base and meeting place.

EDINA MODEL YACHT CLUB SAILS TO SUCCESS

BY RONALD D. SCHROEDER

It stands to reason that Minnesota, the state whose license plates proclaim it the land of 10,000 lakes, is home to a fast-growing RC model sail and electric boat club.

But what sets apart this two-year-old club from others across the country is its unique origin and its successful alliance with a suburban Minneapolis city government. What's more, the club was started by an Edina, Minnesota city employee who wasn't even an RC model boat enthusiast.

The 50-member strong Edina Model Yacht Club (EMYC) was the brainchild of Edinborough Park manager Bill Bach. Bach's task in early 1991 was to find a recreational activity for the park's lake that serves as the centerpiece of the upscale Edinborough Park/Centennial Lakes shopping and residential complex.

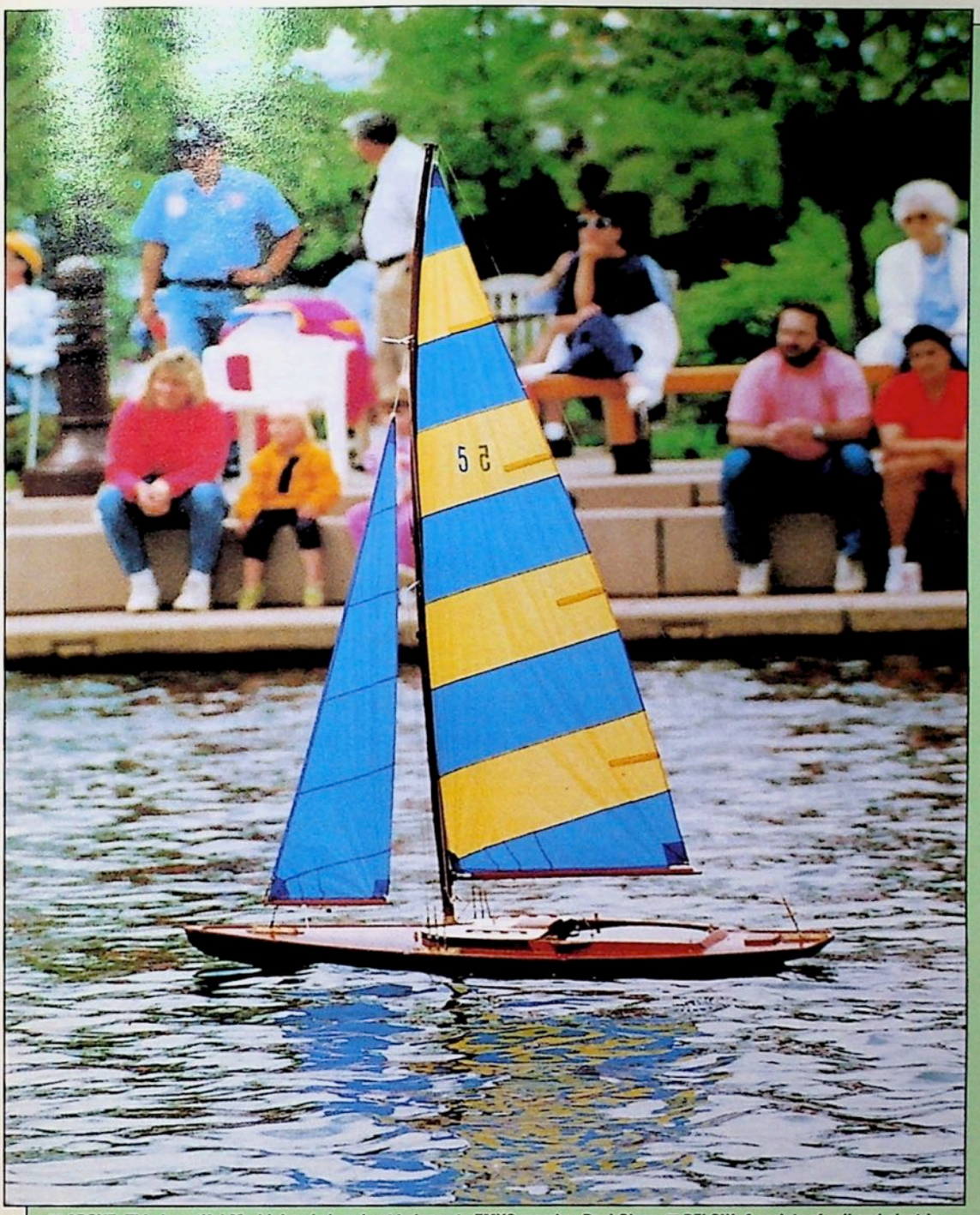
"We wanted an activity that would match the lake's uniqueness," Bach says. "And those of us on the development team recommended that we look into RC boats."

Today EMYC is sanctioned by the American Model Yacht Association and is incorporated in Minnesota as a nonprofit organization. EMYC's credibility has given the city of Edina reason to recognize RC boating as a legitimate sport. Club members are usually found sailing a variety of models any evening or weekend that the ten-acre lake is free of ice and the weather is agreeable. In its organized races, the club competes with East Coast 12-meter and Marblehead class sailboats. EMYC's "Parade of Boats," held annually in early summer, gives members a chance to demonstrate and display boats and recruit potential members.

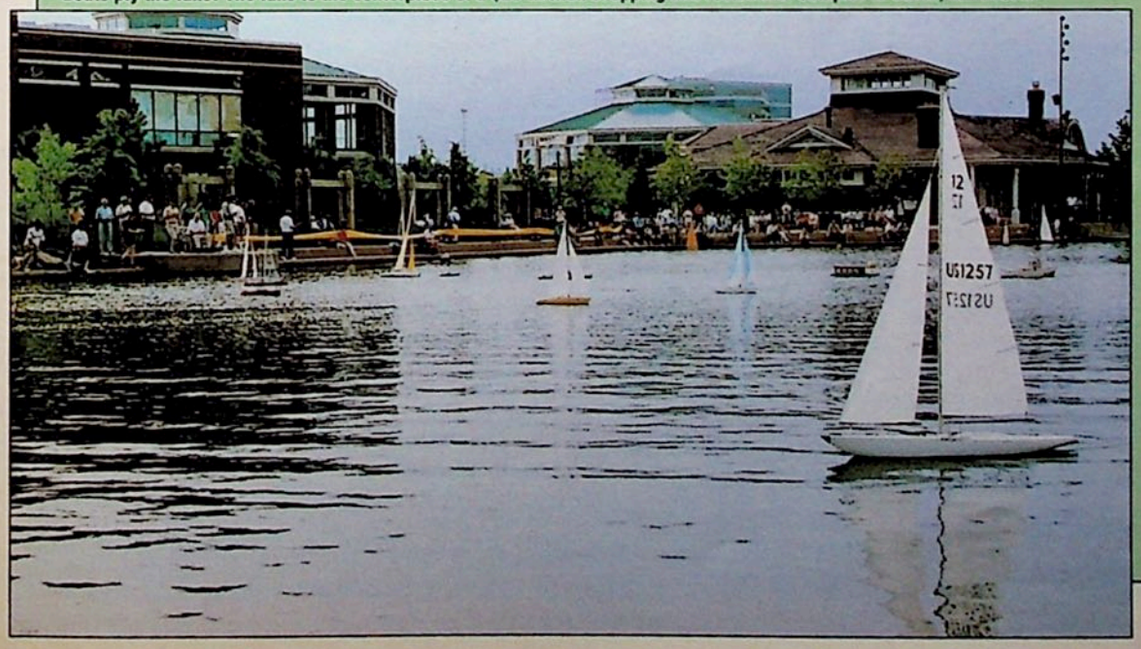
The club as it exists today, flourishing in its environment of government cooperation, belies the fact that a great deal of research and organization went into its creation.

Early in 1991, Bach, working with a University of Minnesota intern, began the initial steps of evaluating the

EMYC Rear Commodore Ralph Peter's impressive 54-inch Robbe Schooner proves indeed that much good can come from an eight-month Minnesota winter. The building behind the schooner is part of the residential complex at Centennial Lakes.



■ ABOVE: This beautiful Marblehead class boat belongs to EMYC member Paul Olsen. ■ BELOW: A variety of sail and electric boats ply the lake. The lake is the centerpiece of a $20-million shopping and residential complex in Edina, Minnesota.



feasibility of developing an RC boat club for the lake in Edinborough Park. Bach liked the idea of RC boating for the lake for three reasons: it provides a friendly use of the lake, it makes the lake a place of performance, and it creates an activity in which people can participate without getting their feet wet.

So Bach began the process of gathering information on RC boats and boaters. Bach turned to AMYA AND NAMBA as sources that could supply support information that would help him decide what to do. What Bach found was that, although there were Minnesotans who belonged to these organizations, no RC sail or electric boat club existed in the Twin Cities metropolitan area.

Hopeful in what he found, Bach decided to hold three informational meetings in August 1991. At the meetings, Bach distributed a survey asking about interest in an RC boat club. The meetings included discussions about the direction a club might take and about expectations of both city employees and RC boaters.

To spark interest, a variety of RC sail and electric boats was displayed at the informational meetings. Included in the display were RC sailboats that Bach had commissioned Minneapolis professional model maker Boucher-Lewis to design and build for Edinborough Park's rental fleet.

Bach compiled a list of local RC boaters who attended the informational meetings or heard about the sailing activity from friends. Invitations to a meeting in September 1991 were sent to the people on the list. At the September meeting and the monthly meetings held through 1991, EMYC set sail as RC boaters and city of Edina representatives began dealing with the formalities of creating a well-managed club.

Club members began writing bylaws and articles of incorporation. At the same time, EMYC applied to the city of Edina to be recognized as the city's of-

ficial authority on RC boating.

At the beginning of 1992, Bach sent a second survey to the RC boaters who had shown an interest or participated in EMYC up to that time. The survey addressed RC boaters' perceptions of the club and gauged how involved members wished to become.

Member involvement was especially important because although the city of Edina initiated the club, Bach knew that EMYC's success depended on weaning the club of some city assistance. If indeed taking more ownership is a measure of success, EMYC proved itself at this past summer's "Parade of Boats."

"The organization of last summer's 'Parade of Boats' was impressive, especially the way club members tightened up the details. Coordinating radio frequencies, creating demonstration programs, and operating the different activities was really a sign of maturity," says Bach.

When Bach took the pulse of the club with the second survey, a few RC boaters complained that EMYC was too organized and decided not to join the club. Bach quickly points out, however, that all RC sail and electric boaters are welcome on the lake although EMYC members do have frequency priority.

That's where the benefits of having a city government on deck are realized. EMYC's recognized status gives club members exclusive rights to sailing times and events. The alliance with the city of Edina also gives EMYC credibility and strength. The association is mutually beneficial because EMYC gives the city a vehicle with which it can monitor the sport.

For example, gas RC boats aren't allowed on the one-quarter mile long lake because of its relative short length and because noise could be a problem for condominium owners just 50 yards away. If someone were to challenge the gas-boat ban, the city of Edina and EMYC, along with Bach, together become the entity to whom the grievance is aired.

As the meetings went into 1992 and EMYC members adopted bylaws, received incorporated status, elected officers, and established $20 annual dues, a sense of real trust emerged.

"There was a good trust factor between the city of Edina and EMYC members. The members saw that we as a city had a genuine interest in RC boating and that we weren't leading them down the wrong path," Bach says.

EMYC members wholeheartedly agree that trust and cooperation are cornerstones in the club's success.

"As an RC boater you get used to being kicked off lakes," says Paul Olsen, EMYC member. "But the city of Edina really wants us to be here. Sometimes I have to pinch myself to see if it's really happening."

The spirit of cooperation between EMYC and the city of Edina is apparent in their experience with the park's rental fleet. The RC sailboats, rented to the general public for $3 per half hour, were sometimes returned damaged or broken and often required maintenance. Especially susceptible to breakage was the two-piece keel/ballast assembly. EMYC members designed a more rugged sailboat that would better withstand rough treatment by inexperienced renters. Unlike the sailboats in the old fleet, the new boats have ballast that's molded into the hull and employ a protection fin around the rudder.

The rental fleet represents an important part of EMYC's philosophy because it allows anyone to participate in the club. Model boat enthusiasts unable to afford the high start-up cost of RC sailing may begin with a rental boat at a relatively low cost. The rental fleet also typifies the interdependent relationships that help make EMYC successful. Some of the boats in the rental fleet are sponsored by retailers in the Edinborough Park/Centennial Lakes complex. A retailer buys the sailboat and makes a $50 donation to EMYC. In return, EMYC members build the boat and affix the establishment's name on the sail. The city of Edina benefits too from the revenue that the rental fleet brings.

Spectators enjoy a display of assorted RC boats in Edinborough Park's Centrum building, during the club's Parade of Boats event.

Club member Bob Lund, left, and his wife Sherry Lund, right, staff the information booth at EMYC's "Parade of Boats." The booth displayed RC boats in various stages of construction and provided information about EMYC.

EMYC's affiliation with the city of Edina entitles the club to hold its meetings in a 600-square-foot room with plush furniture and a fireplace inside the Edinborough Park Centrum building. The Centrum building also is used during the club's "Parade of Boats" to house an information booth and various boat displays.

About ten feet from the Centrum building lies the lake. The lake's chief function is to collect rain runoff from the surrounding complex and streets so the water quality isn't good. That's why RC boating serves the lake so well. The lake's bottom is covered with a rubber liner that lies beneath a foot of sand. At its deepest, the lake is about nine feet. The launching area consists of over 150 feet of concrete retaining wall which includes built-in bleachers for spectators.

Air currents over the lake are an exaggeration of actual winds because of the buildings that surround it. The air tends to drop in and winds occasionally become gusty. Despite its relatively small size, the lake can become slightly rough. But this usually isn't a problem because Twin Cities winds are for the most part light.

But for the club itself, sailing has been smooth. EMYC members, city of Edina officials, Centennial Lakes merchants and Bach all consider the club an enormous success. For Bach, EMYC's achievements have been especially rewarding.

"My greatest satisfaction is seeing something that I initiated take off to a point where EMYC members have taken ownership. The members are controlling the club in concert with the city. We both think that we've got a great thing going. And so the ultimate satisfaction is that after only two years, EMYC has proven to be a win-win proposition," Bach says. "We both feel we've got the world by the tail."

More information about EMYC may be obtained by writing to: Edina Model Yacht Club, Centennial Lakes Centrum, 7499 France Ave. So., Edina, MN 55435. Information about forming RC boat clubs may be obtained by writing to: American Model Yachting Association, c/o Patricia Hein, 1884 Campus Ct., Rochester Hills, MI 48309; or North American Model Boating Association, 1815 Halley St., San Diego, CA 92154. •

BOOK REVIEWS

BY SCOTTIE DAYTON

Sea of Glory, A Naval History of the American Revolution by Nathan Miller, Naval Institute Press, Annapolis, Maryland, 1992. Hard cover, 558 pages, 28 black-and-white photographs, appendixes, bibliography and index. 6x9" format.

Greed, ineptitude, mismanagement, misconduct, nepotism and political preferment on both sides of the Atlantic created an interesting though often frustrating chain of events which culminated in 13 rebellious colonies gaining their independence from Great Britain. Miller traces the American Revolution mostly through naval conflicts instead of land battles, using excepts from correspondence and ships' logs to bring the principals to life.

Those looking for a good sea story will find the first half of the book a slow read. It covers initial sparring between opponents, political intrigue, and how lack of arms, munitions and men affected American and British campaigns. The enormous waste of shipping and lives lost due to incompetent colonial captains and disease makes one marvel at the average citizen's will to keep fighting.

The pace quickens when Miller focuses on what life was like for the ordinary seaman. Much of this comes from John Masefield's *Sea Life in Nelson's Time*. Smallpox and fever ravaged American ships, pay was dismal, and sailors often fought battles with little training or naval discipline. Privateers, with their potential for instant wealth, continued to drain the most able seamen from the Continental Navy throughout the war.

Miller's chapters on privateering and the lust for profit make exciting reading. Privateering proved what the average individual could accomplish when unfettered by government and politics. Failure, however, meant barbarous imprisonment aboard British hulks anchored off New York.

Sea of Glory is a splendid and accurate account of the vital part sea power played in the American Revolution. Miller is to be commended for how well he balances the Colonial, British and French roles. Historians and modelers who prefer this time period will certainly want to add his book to their reference libraries if they missed the first printing in 1974.

• • •

Naval Institute Guide to the Ships & Aircraft of the U.S. Fleet by Norman Polmar, Naval Institute Press, Annapolis, Maryland, 1993. Hard cover, 639 pages, over 950 black-and-white photographs and line drawings, general index, five appendixes, and ship name and class index. 9x12" format.

Massive and comprehensive best describe this 15th edition. The effort and work that went into compiling the information is mind-boggling.

Polmar begins with a "State of the Fleet" report which focuses on how the end of the Cold War, the breakup of the Soviet Union, and the lessons learned in the Gulf War are affecting the U.S. military establishment. The author then provides a history and breakdown of our defense, Navy and fleet organizations. Also covered are the fleet marine force, military sealift command, Navy personnel and naval reserve.

Polmar's style is easy to read while statistics are presented in numerous tables. However, the text's 8-point type could prove tiresome or difficult for older eyes. On the other hand, each page is attractively laid out with enough photos or tables to break up and balance the amount of body copy. Photos are sharply focused and often run the width of the page. Footnotes are listed on the same page as their corresponding number instead of in the back of the book.

Chapters on types of ships and aircraft begin with an analysis of the changing inventory and how it is affected by budget and program cuts. New features include a chapter on the Navy's growing fleet of military sealift ships. Also covered is the ongoing effort to develop a mine counter measures force in response to problems encountered in the Persian Gulf and the Navy's continued confusion in that area.

Any naval history enthusiast who seeks up-to-date information on the modern U.S. Navy should look to this book first. There is no other unclassified publication which so completely covers the facts, figures, and status of our maritime forces. •

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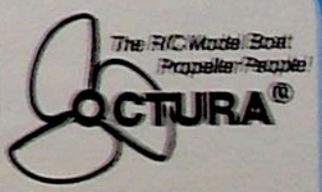

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product survey

BY W.H. GEBHART

FUTABA SUPER CANDY DEEP VEE

Hey, there's a new kid on the block! It's the Futaba Super Candy Deep Vee. Introduced at the '93 Chicago Model Hobby Show, it was a hit with attendees (who could see it running in the demo pool) and distributors, who ordered more than had been built in the first production run.

Futaba, better known as the world's leading producer of digital proportional radio control equipment, also has a line of RC model planes, cars, and boats. The Super Candy is the most recent addition to their boat line. We may witness additional entrants sooner than planned, considering its apparent early success.

Like any family with a new offspring, Futaba must've experienced some trepidation about how it would be received. It was a corporate decision to retain the Candy name, even if it does evoke memories of a previous sibling whom, shall we say, acted with less than perfect behavior. But as anyone with older brothers and sisters knows, living up to or living down their reputations is all part of growing up.

Armed with some of the lessons learned from the shortcomings of the original Candy, R&D at Futaba carried on a rigor-

The Super Candy looks mighty good on the water.

ous program of testing and redesign on Project: Super Candy. Occurring over a period of six months and involving a major hull reconfiguration, the third rendition was the charm.

Don Rice of the marketing department at Futaba Corporation of America, who had oversight responsibilities on the project, traced the evolution of the Super Candy for me.

"The Super Candy was developed uniquely for the U.S. market with the first-timer in mind. Our broad focus was to produce a high quality product that was very stable, very maneuverable and would hold up."

The novice is the lifeblood of any sport, any hobby. When this realization is overlooked, his nurture neglected, fresh enthusiasm dwindles and the pursuit of that pastime becomes elitist and its popularity short term.

Ironically, the beginner is generally given short shrift, so it's encouraging to see a major modeling company with the marketing resources and large distribution network of Futaba's, give him some attention. It's also an example of sound business sense. We all know the importance of good first impressions, not only for the sport/hobby but also for the company.

Don further explained Futaba's development of the Super Candy.

"The first version they sent us ran real bouncy, it "porpoised" and never would get up on plane."

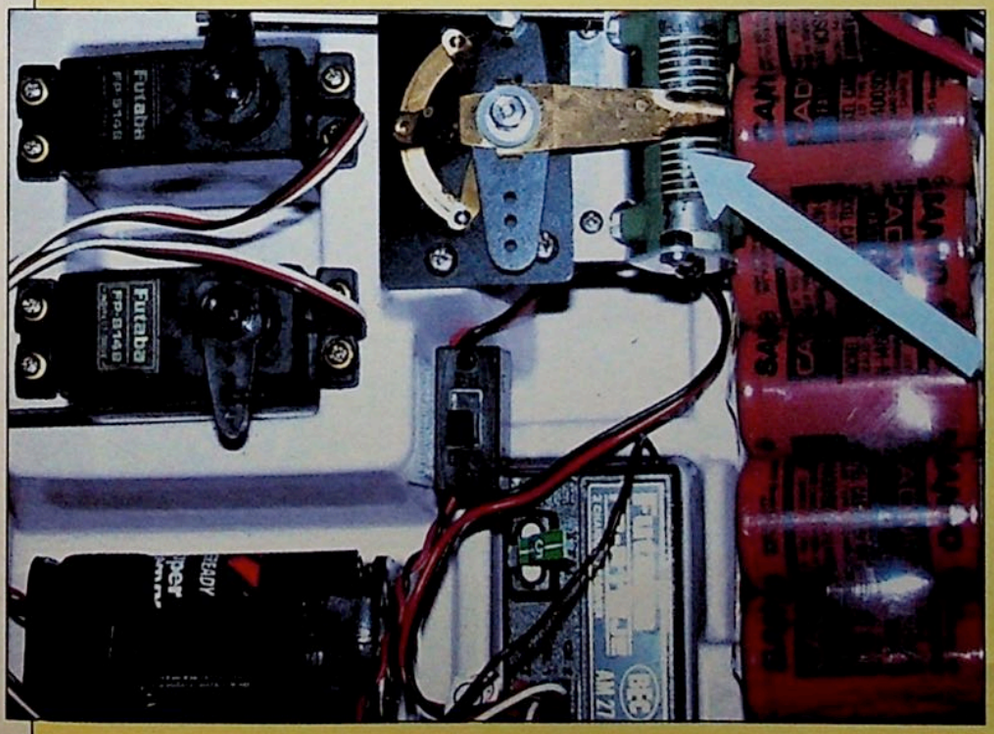
It was sent back twice before it met with

continued on page 46

SPECIFICATIONS

HULL TYPE	Deep Vee
LENGTH	22.5 inches
BEAM	8 inches
DISPLACEMENT, w/o batteries	2 pounds
MOTOR	540 Mabuchi
DRIVE TRAIN	Direct drive/universal coupling
SPEED CONTROLLER	Mechanical/ proportional w/ reverse
BATTERY:	6-cell recommended, 7-cell used in review
RADIO SYSTEM:	Futaba Magnum Sport 2-channel w/two S-148 servos

■ LEFT: A minor amount of assembly stands between the box and the water making the Super Candy truly RF. ■ RIGHT: Pintle and gudgeon attachment of wedge shaped rudder with T-bar steering lever mounted on top of rudder shaft.



■ ABOVE: The backyard pool tested the Super Candy's maneuverability. ■ LEFT: Clean installation of batteries, servos, batteries and radio system. Arrow highlights wiper and variable resister. Engine pan is visible at right edge of photo. ■ BELOW: Up on plane and in perfect trim on the first try.

product survey

BY PHIL DYSKOW

KYOSHO FAIRWIND II RC SAILBOAT

Having just recently completed another RC sailboat kit from Kyosho (the Beneteau 53 F5), I was looking forward to assembling the Fairwind II. The first thing I noticed that differentiated the two kits was their size. The Fairwind II is about 36" long, which places it roughly in the one-meter class, and the Beneteau is dwarfed by comparison at 24.8 inches, Although there are many features I like about the Beneteau, the Fairwind II is a much more serious sailboat and promised enhanced performance that I was anxious to experience first hand.

The extra size and performance of the Fairwind II comes at a price in that it is slightly more complex to assemble. However, I would recommend it without reservation for the beginner with average mod-

■ LEFT: The radio system used for the Kyosho Fairwind was the Hitec Ranger, a 2-stick adjustable trim, reverse-equipped transmitter, with BEC receiver, battery-holder switch harness set, two HS300 direct-drive servos, horns and hardware sets. ■ BELOW: Author Phil Dyskow tested the Fairwind at his favorite park pond and reported it's an excellent sailing model.

eling skills. No specialized tools are required for assembly. A scissors, wire cutter, awl, needlenose pliers, Phillips screwdriver, hobby knife and sandpaper are all that are needed. Extra tools that come in handy during construction, if the builder has access to them are: an X-Acto knife set, a Dremel tool set, a Scroll saw and a fixed place disc or belt sander.

Three types of glue are used, two-part epoxy, Super Glue and an Elmer's type wood glue. My only negative comment about assembly is that the instructions are written in "Jinglish," a combination of English and Japanese that can be confusing. However, if careful attention is paid to the illustrations it is not difficult to avoid errors.

A two-channel radio control system is required along with the usual receiver, battery pack, receiver switch and rudder servo. The receiver USB&SM obtained for this review was the Ranger 25 by Hitec RCD Inc., a narrow band RC surface control system designed for the entry level RCer. It features 2-stick adjustable trim, reverse-equipped transmitter, BEC receiver, battery holder switch harness set, two HS300 direct-drive servos, horns and hardware sets—and has a list retail price of only $69.95.

The instructions recommend a winch servo for sail trimming that has more torque than the servo that normally comes with a two-channel system. I selected the Futaba FP-S125, A slight modification may be necessary to fit the electrical connector of the FP-S125 to the receiver.

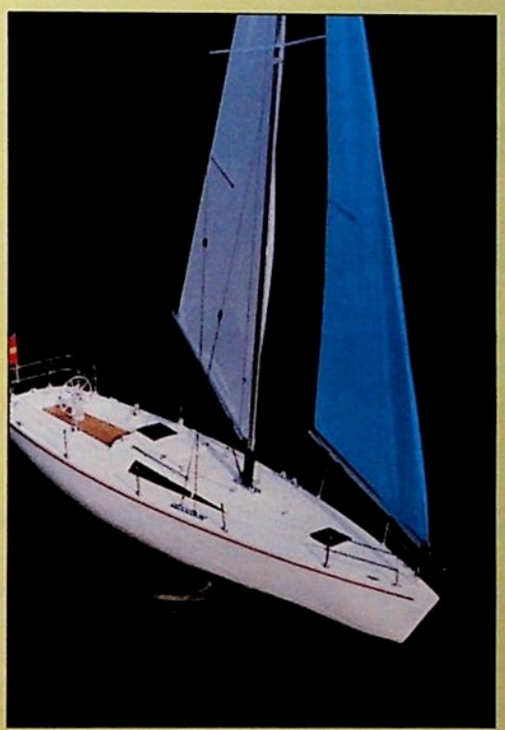
The first step in assembly is to plane away the burr at the parting line that runs through the center line of the hull and deck. The hull is of one piece blow-molded ABS plastic, and removing the parting line burr is not difficult although great care should be taken to minimize any filling and sanding. I used a variety of tools as angles and accessibility vary greatly. However, a common hobby knife would probably suffice. With careful treatment at this step, I was able to proceed to painting with only light sanding, and no need for filling.

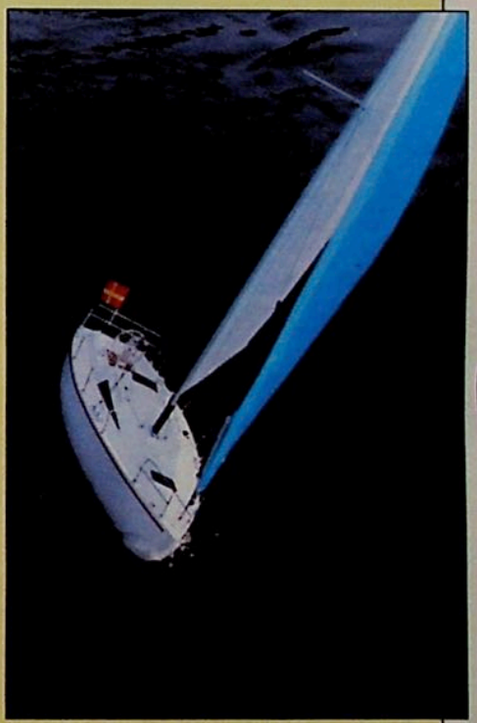
For me, color selection was easy. Turn of the century yacht builder and designer Capt. Nate Herrshoff is quoted as saying: "There are only two colors to paint a proper yacht, white or black, and only a fool would paint one black." Therefore, I chose a white enamel finish, utilizing Testor's #1245 gloss spray finish. The only surfaces that require painting are the hull and deck assembly (one piece) and the cockpit/hull access piece. While these assemblies were drying, I assembled the very sturdy, wood cradle so that it would be ready when I continued on to the next step. The scissors type wood cradle utilizes nylon cross-straps to securely hold the yacht in place.

With the hull now dry, the next step is to place the vessel on its cradle and install the ballast. The Fairwind II carries its ballast internally in the hollow keel cavity. The recommended ballast weight is 2 kg. However, as I used the heavier Futaba FP-S125 winch servo, only 70% of this ballast was used (about 1.7 kg).

Ballast is not included with the kit, so it must be purchased separately from your hobby dealer. Lead or steel pellets can also be purchased from most hunting supply stores. Remember that lead is better in that it is a denser metal and enables you to place the ballast lower in the keel for additional stability. Bonding the ballast in place is accomplished by pouring a liberal amount of wood glue over it. Be careful not to use too much as it represents additional weight, and will take longer to cure.

After the ballast glue has dried, the next step is to bond the die-cut wood mast support step in place. This piece transmits the load of the mast from the deck solidly to the keel. Incidentally, the quality of all of the die-cut wood parts was very good in this kit. Die-cut wood parts are also used in the next step, which is to build a





■ **TOP: The standing rigging is easily adjusted for optimum mast tuning, and the mast step allows for three different positions to relieve weather or lee helm. The running rigging has adjustments for the mainsail halyard, outhaul and boom vang, and the self tending club jib is well thought out as well.** ■ **LEFT: In the water, the Fairwind sat evenly on its lines.** ■ **RIGHT: The best points of sail for the Fairwind II appear to be beam reaching or close hauled. When the wind is dead astern the club jib seems to get blocked from clean air by the mainsail and running wing and wing is difficult.**

platform to hold the batteries, rudder servo and sail winch servo, and the receiver longitudinal supports are glued in place under the deck to spread the load of the main sheet system out over a broad area.

After enough time has gone by to let the glue dry on all of the steps just mentioned, the hull is flipped over to install the rudder and rudder bearing. Care should be taken to insure that these parts are installed at exactly a 90* angle to the deck and in alignment with the keel.

After the hull has been placed back on its cradle, the batteries, rudder servo, sail winch servo and receiver can be installed. Care needs to be taken to secure all loose wires in a seaman like manner to prevent them from fouling on the sail trim lines when they are installed.

With all the electronics in place, now is a good time to test everything for proper operation. Be sure that the rudder angle is in line with the keel when the control stick is in a neutral position. The receiver switch is now mounted to the deck so that it can be actuated without lifting the cockpit access piece. The rubber spray cover that came with the kit did not fit my receiver switch. I ended up mounting the switch without it, but will have to address this issue at a later date or face constant switch replacement due to water damage.

At this point in assembly it is time to festoon the deck and cockpit with various pieces of sailing gear, some functional, some only decorative. Most of the decorative pieces are glued in place, but the functional pieces (like chain plates and fairleads) are secured with 2x8mm or 3x8mm self-tapping screws.

An interesting series of illustrations tells of how to secure the non-functional deck winches with rubber bands so that if fouled with a sheet (sail trim line) they will lay over to free the sheet. However, as there would then be a series of holes to let water in on gusty days, you are given the option of gluing them in place. In an actual sailing situation these pieces can foul on the sheets, but it only happened to me once when the boat was on its stand.

A hole must be drilled in the transom to accommodate a drain plug, and sponge tape is included to seal the cockpit/access piece. I like the way the bow pulpit, stern pulpit and life line stations are attached with 2x8mm screws instead of glue. That way they can be easily removed if it becomes necessary to make modifications or repairs when they might be in the way.

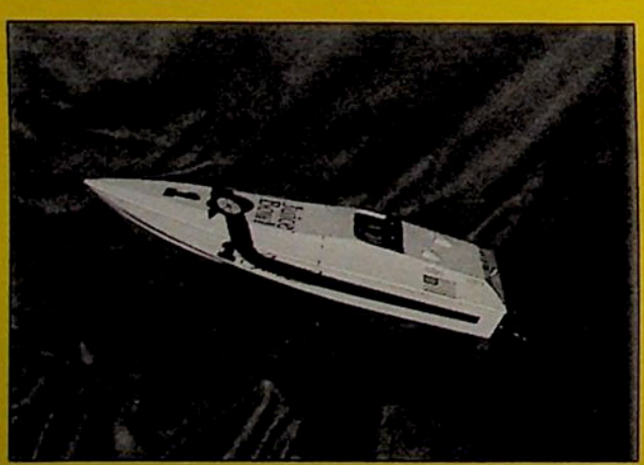
One of my concerns with the other Kyosho kit I built was the way the mast, standing rigging and running rigging was set up. However, I was very pleased with the straight forward seaman-like approach used in the Fairwind II. The standing rigging is easily adjusted for optimum mast tuning, and the mast step allows for three different positions to relieve weather or lee helm. The running rigging has adjustments for the mainsail halyard, outhaul and boom vang, and the self tending club jib is well thought out as well. As all standing and running rigging is secured with snap clips, it is not difficult to knock down the mast and sails for easy transport or storage.

Like other Kyosho kits I have built or seen, the Fairwind II comes with a very complete set of decals to apply to the hull and deck structures. Just how many of these you elect to use is certainly a matter of taste. Although I have no doubt that the Fairwind II would look yacht club sharp with the colorful hull graphic decals, I elected to pursue a more traditional treatment. I settled for a simple red cove stripe, just below the deck level. This really gives the yacht a classic appearance, and it also means I didn't have to cover my slick paint job with a big hull graphic decal! I did use all of the other decals supplied, and they set off the Fairwind II very nicely with no further paint or trim required.

Even though it was early December, the weather in Huntington Beach, California cooperated and I had an excellent day for the maiden voyage. The city pond I used as a launch site was abandoned except for a few migratory ducks, and the wind blew softly from the northwest. Before I actually launched the boat, I checked the range of my radio control unit (and embarrassingly installed the antenna for the receiver, which I forgot to do earlier).

I positioned myself so that I could launch the Fairwind II on a close reach and it practically flew from my hands despite the light wind. I was concerned that I may have over ballasted the Fairwind, but it sat evenly on its lines. I could detect an almost neutral helm, so I sailed back over to shore so that I could rake the mast forward slightly to create a little weather helm. However, I did leave the mast in the middle of the three step positions. I had set up the halyard tension fairly hard with the assumption that the sails and halyards would stretch, but the light winds were not strong enough to accomplish this. Another trip back to shore, and I adjusted the mainsail outhaul and the halyard tension of both sails to take some of the hard spots out of the sails.

The best points of sail for the Fairwind II appear to be beam reaching or close hauled. When the wind is dead astern the club jib seems to get blocked from clean air by the mainsail and running wing and wing is difficult. At the end of our first sail I opened the cockpit access piece and



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found the hull to be bone dry. Although we were not playing "Victory At Sea" on this particular day, I took the dry bilge to be a good sign.

I was not able to obtain precise specifications from the manufacturer in time for this article. However, my approximate dimensions are as follows:

L.O.A. (Length Overall) ..... 36"
L.W.L. (Length, Waterline) ..... 32.5"
Beam ..... 8.75"
Overall Height
(Bottom of Keel to Masthead) ..... 60.2"
Ballast ..... 3.7 lbs.
Total Weight ..... 7.8 lbs.
Sail Area ..... 590 sq. in.
Radio ..... Hitec RCD's Ranger 25, 2-channel.

Although I cannot speak for the die hard racer, I would think that almost anyone would be pleased with the performance of the Fairwind II. The manufacturer does not represent this kit as the answer to a go-fast racers dreams, but for the rest of us there is plenty of performance for the amount of money invested. I like this sailing yacht a lot, and plan to have many hours of fun and relaxation with it in the near future.

OCEAN 500 ALSO NEW FROM KYOSHO

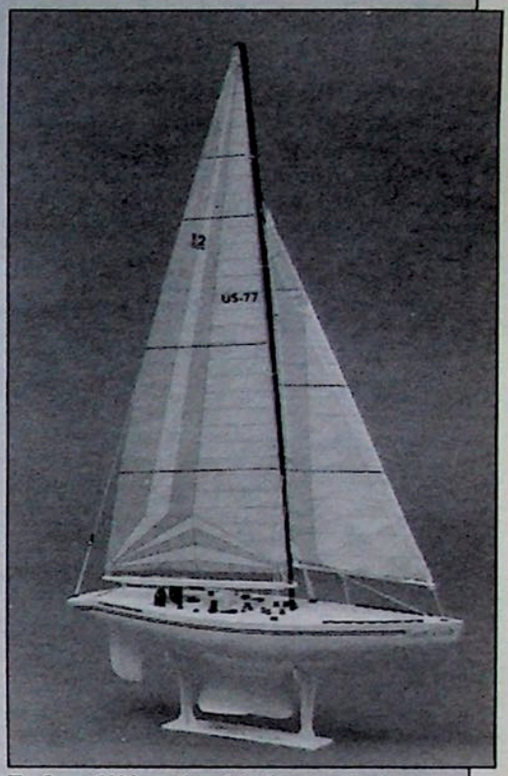
In the Winter '93 issue of *USB&SM*, Phil Dyskow reviewed the Beneteau sailboat, one of three in a series of new models from Kyosho and distributed by Great Planes Model Distributors Co. The Fairwind II is reviewed above. The third, the Ocean 500, not formally to be reviewed, is nonetheless another excellent model in this trio of sailboats. Information about it is as follows:

The Ocean 500 was designed specifically to get first-time sailors off to a great start in the exciting world of RC sailboating, and features true-to-scale America's Cup styling. It comes mostly pre-built, with a minimal number of parts. The one-piece molded hull and keel go together quickly.

On the water, the Ocean 500 demonstrates good sailing characteristics. The hydrodynamic winged keel is already loaded with ballast for speed and durability even in a strong wind. All that's required to operate the Ocean 500 is a standard two-channel radio. Two rudders are included—one for sailing and one for display.

The Ocean 500 is patterned after an authentic America's Cup yacht, featuring many decorative accessories such as railing, wheels and cabin detail. The specifications on the Ocean 500 are listed as:

Length ..... 19.7 in.
Height ..... 31.2 in.
Beam ..... 4.6 in.
Sail Area ..... 163 sq. in.
Weight ..... 2 lbs.



The Ocean 500 is another of the three excellent entry level sailboats from Kyosho.

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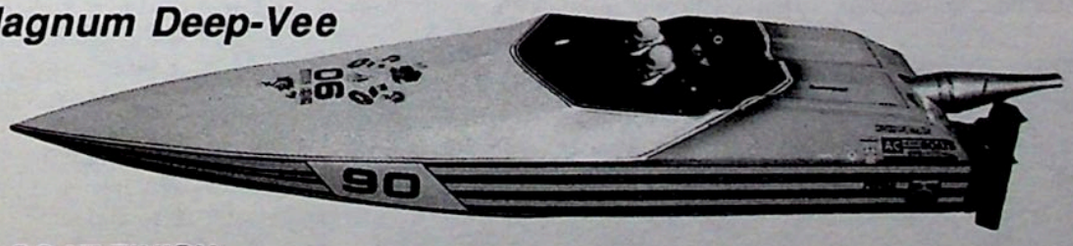

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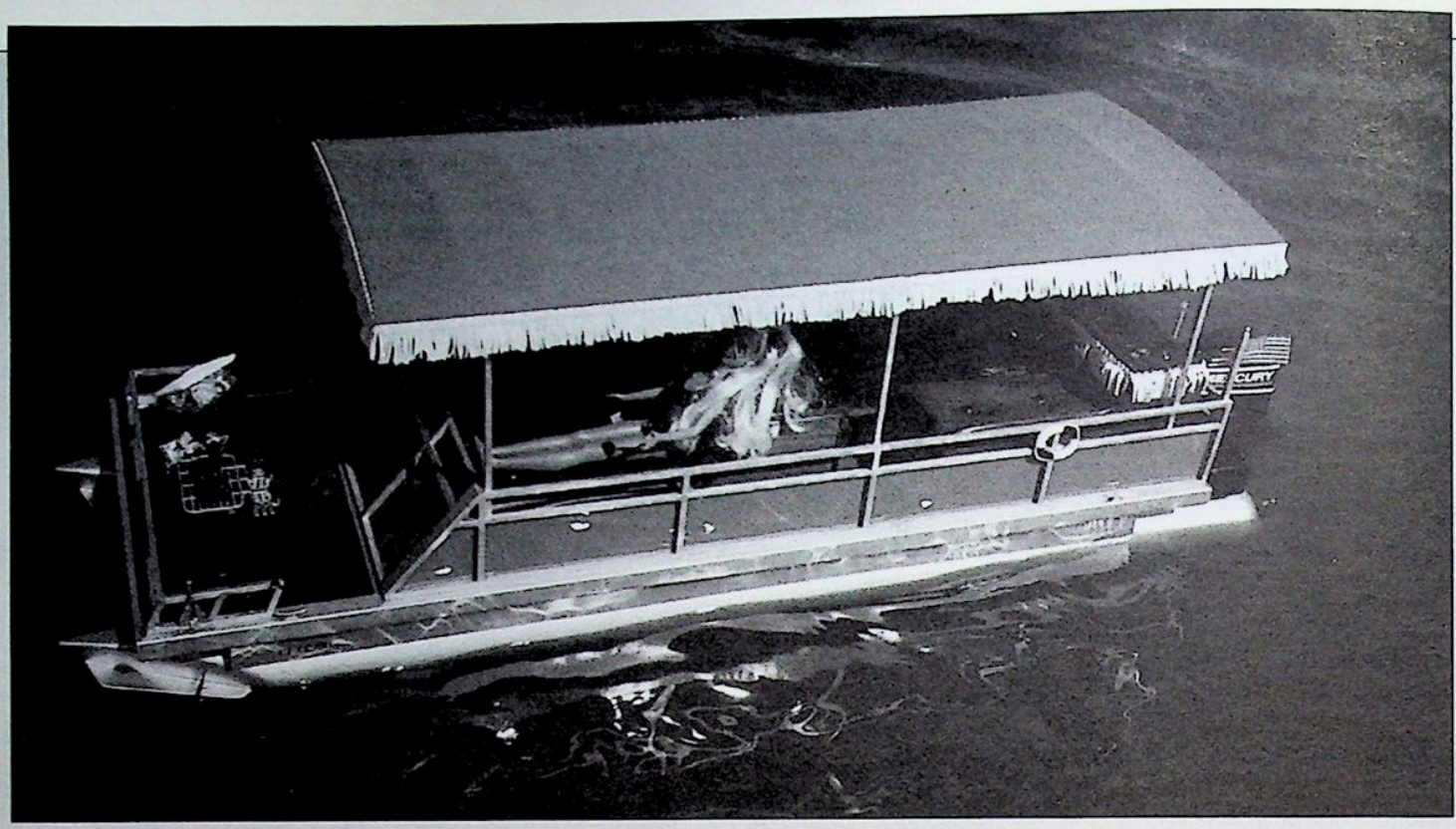


Build A Pontoon Boat

BY BILL RICE

What happens when you can't find plans of a boat you'd like to build? In the case of F.B. "Andy" Zigan, you just create your own from scratch.

"I had never built a model before, let alone a radio control model. While looking at several catalogs, I found many different types of boats and plans. I have quite a bit of woodworking experience, and while trying to decide what type of boat to build, a co-worker suggested I build a 1/8 scale model of a 24-foot pontoon boat," said Zigan.

"Because I live at Lake Nacimiento (central California near Paso Robles) and have my own boat dock and a friend who parks his 24' pontoon boat in a nearby slip, I though his idea was perfect."

Zigan had not seen any plans or kits for such a boat, so he got out his pad and tape and starting measuring his friend's boat. The result was a set of plans and a scale model which Zigan is now offering readers of USB&SM.

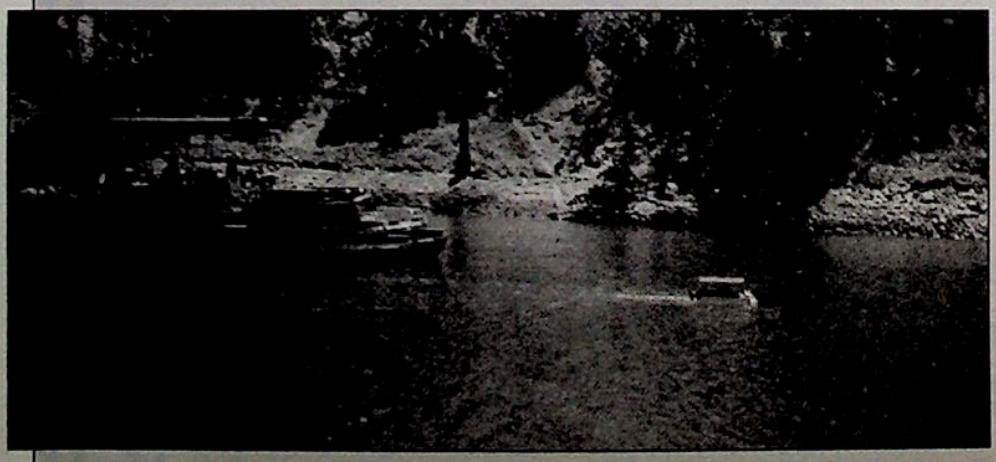
On his scale model, the pontoons are made of 3-inch plastic irrigation pipe and the front points and rear caps are wood which he turned on his lathe and cut the points on his bandsaw. The deck is 1/2" balsa with peel and stick green felt covering, the handrails are 3/16x3/16" balsa and a balsa canopy covered with MonoKote.

The front lounges each hold a 6-cell pack which Zigan hooked together under the deck with a "Y" connector to bring power to the rear lounge area where the electronic speed control and rudder servo are located for the MRP outboard.

At first, Zigan needed only a 2-channel radio to operate the pontoon boat, but his wife came up with some added suggestions to "trick it out." He installed a second servo to operate two on/off switches and upgraded to a 3-channel radio. The "tricks" include running lights, a Walkman-type cassette player with 1-1/2" speakers mounted in the rear lounge, leather seats, ice chest, BBQ, two dolls and two water cannons mounted under the deck, which should two 1/8" streams of water 20 to 30 feet.

"You should see the reaction when I pull up to a full-sized boat—turn on the cassette and fire the water cannons," says Zigan.

The plans and instructions for building a similar pontoon boat are available from F.B. "Andy" Zigan, 4655 Silver Saddle Lane, Paso Robles, CA 93446; telephone (805) 238-7846. •



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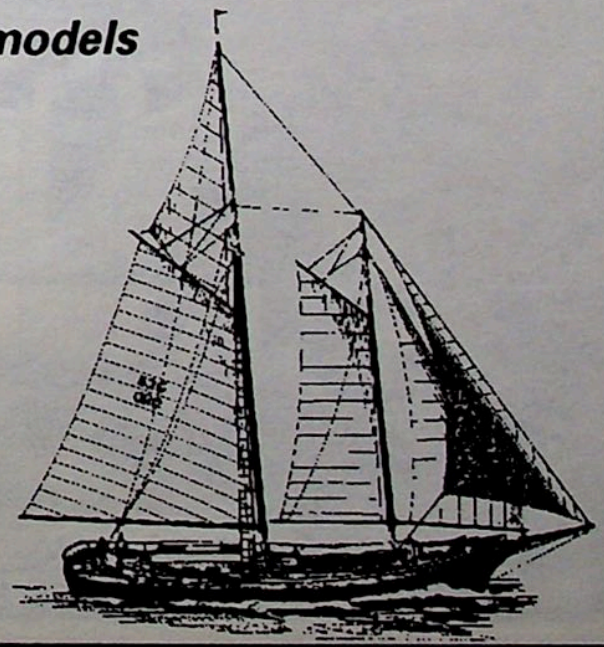
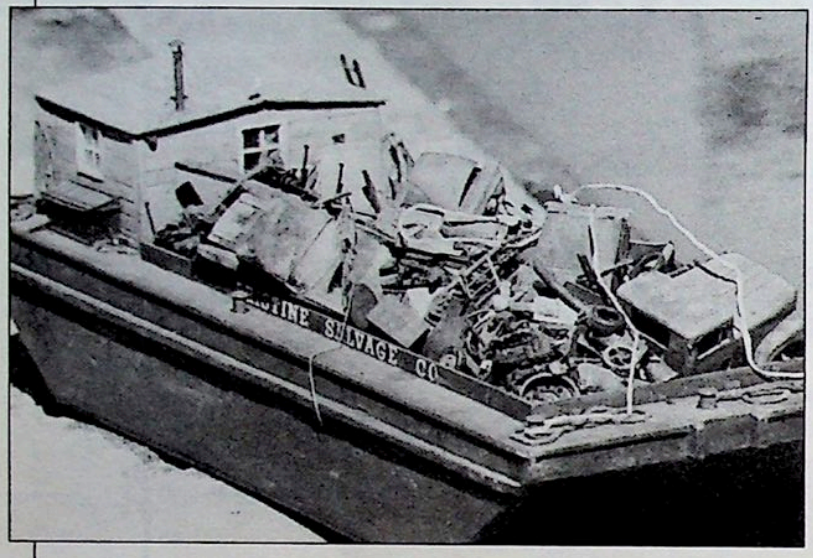
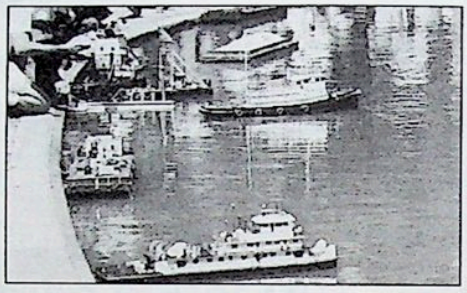
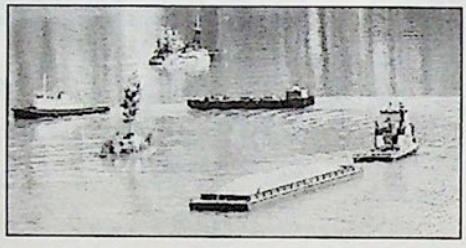


Tugboats Star at '93 Crowley Cup

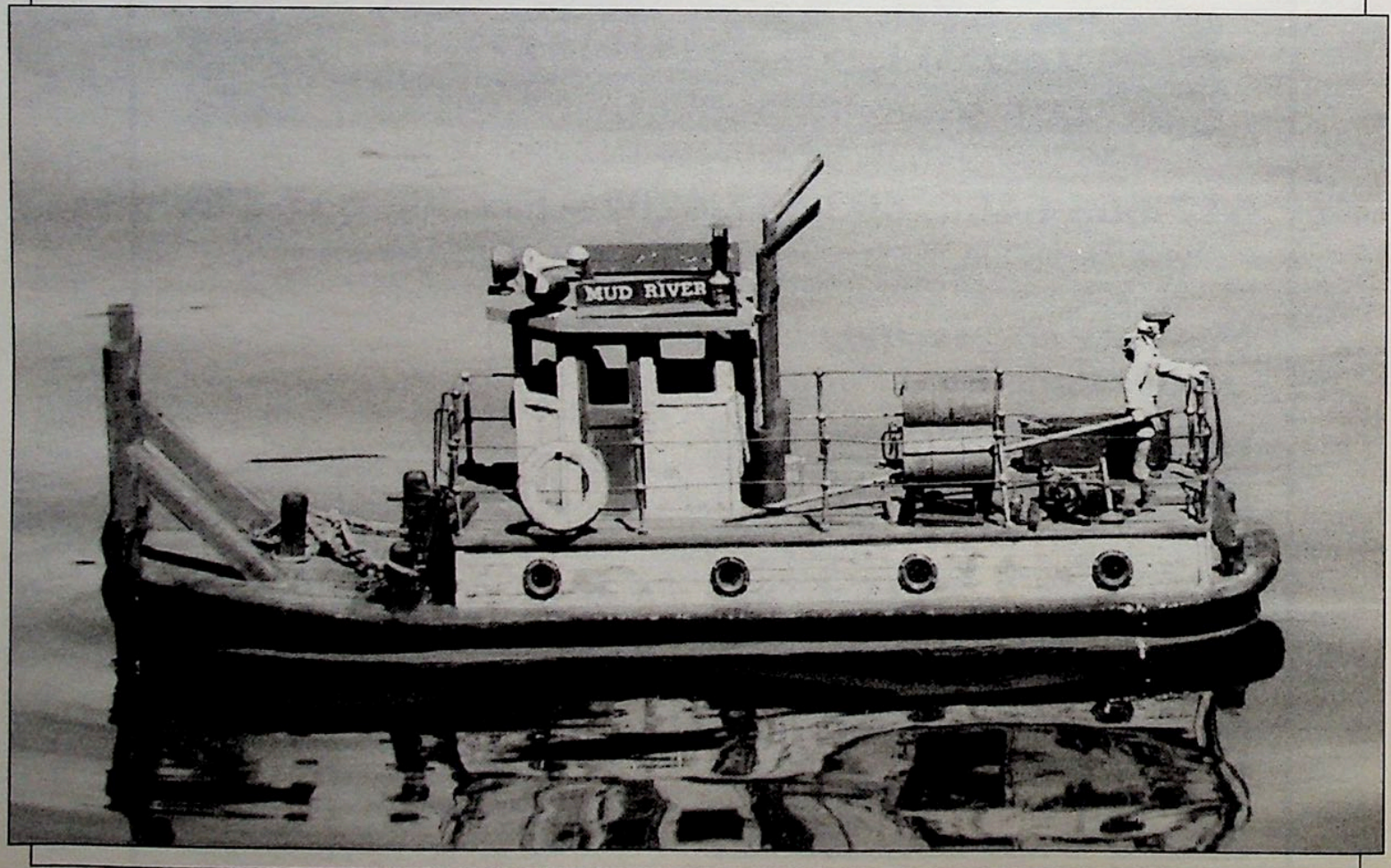
BY KURT A. GREINER

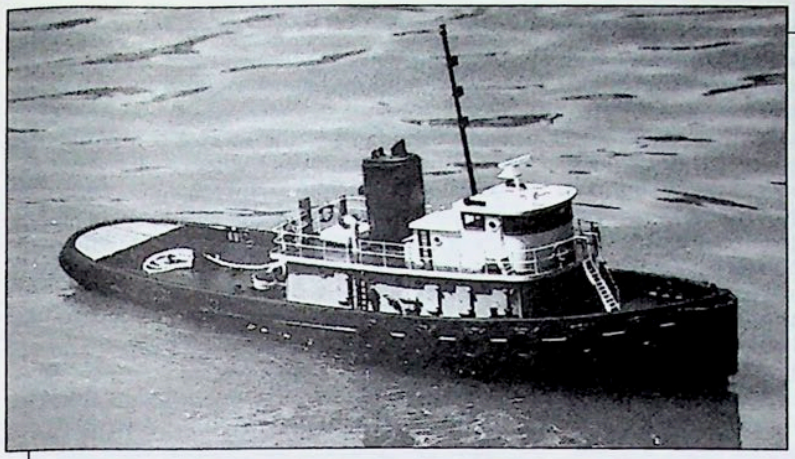


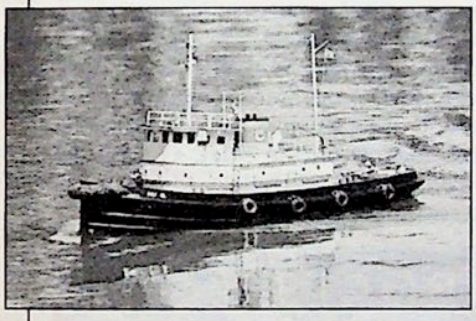


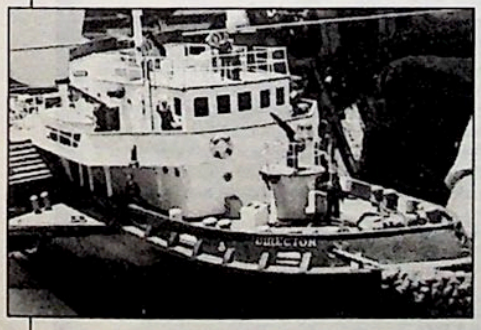


■ FAR LEFT: All entries are required to tow barges through the course; some bring their own, often quite detailed such as this example. ■ LEFT TOP: Many tugboats were entered in various stages of the Crowley Cup competition. ■ LEFT BOTTOM: Tugs following the course. Note the realistic obstacles and the realistic traffic! ■ BOTTOM: Best of Show was won by the diminutive *Mud River* with a perfect score. Leal Kanstein has shown that he sets the standard for this competition with excellent construction.









■ TOP: Troy Waters, owner of Harbor Models in Fountain Valley, California, won his class with the *Sea Otter*. This tug was also built on The Scale Shipyard hull, the *Carol Moran*, but was modified considerably from the plan. ■ ABOVE: The author's entry, the *Dorothy K. Greiner*, was built using The Scale Shipyard semi-kit for the *Edmund J. Moran*. This company makes a nice selection of tugboat hulls and fittings in addition to its better known warship offerings. ■ LEFT TOP: The *All G* approaches the shore following her run. Model by Steve Cowdin. ■ LEFT BELOW: The *Director* was a tugboat used in England to assist the docking of naval ships, especially aircraft carriers, until quite recently. Scratch-built from British plans by Wayne Doty. ■ LEFT BOTTOM: The *Snake River* was built by accomplished modeler Leal Kanstein. A fine model that had exceptional maneuverability. ■ BELOW: A detail shot of the *Snake River* illustrates the craftsmanship of this model.

Editor's Note: Kurt Greiner is a modeler from the San Francisco area with a lifelong interest in ships and the sea. He has authored a number of articles on ship modeling for both American and European magazines.

It had the prospect of being a typical San Francisco summer day, gray and cold. Perhaps not an entirely inappropriate setting for a celebration of an unique facet of model ship building, the scale model tugboat. In the end, nature relented and provided a delightful day, with sunny skies shining above the contest, the 1993 Crowley Cup, held last June.

An important feature of the San Francisco Model Yacht clubs calendar, the Crowley Cup has grown in size and popularity over the years, attracting modelers this year from as far away as Hawaii who come to see and participate in this event.

This regatta is unlike most in its devotion to a single modeling subject - the radio controlled scale model tugboat. All judging is done on the water, with the vast majority of competitive points derived from realistic and skillful handling of the model. The course is challenging, particularly since it must be negotiated while pulling a loaded barge. This can lead to some interesting consequences, especially when the wind kicks up, a circumstance not entirely unknown in San Francisco!

The event is made as realistic as possible. Smooth, scale like operation is important to the judges, who are real life professionals in the maritime field. When a real tugboat Captain says that a maneuver should be done a certain way, it is hard to argue.

Twenty-seven models were entered. These were divided into two classes by hull length, the division at thirty inches. The larger class outnumbered the smaller this year, but both were very competitive with small margins separating the leaders.

Best of Show
Leal Kanstein, *Mud River*.
Under 30"
1. Troy Waters, *Sea Otter*.
2. Til Mossi, *Patricia*.
3. Jeremiah Huddleston, *Robert V II*.
Over 30"
1. Tony Abela, *Zuba*.
2. Robert Vienot, *Doxy II*.
3. Kurt Greiner, *Dorothy K. Greiner*.

In addition to the modelers, the event is also attended by members of the model trade, who display and sell their products. Often this is a chance for participants to see items that are rarely available in other forums.

Bruce Hoffman, the contest director, and the other members of the club did an outstanding job on this very enjoyable event. Should you wish to participate in the 1994 Crowley Cup, write the club at: The San Francisco Model Yacht Club, 450 Taraval St., Suite 235, San Francisco, CA 94116.

The following business' were represented at the competition:

•ScaleShips, P.O. Box 12131, Marina del Rey, CA 90295 (send SASE).

A manufacturer of a very nice 1/48 scale semi-kit of a modern T-ATF, ocean-going Navy tug. Also makes a variety of fittings in 1/48-scale for modern U.S. Navy warships, and has future plans to market a range of 1/48-scale modern U.S. Navy hulls.

•Harbor Models, 17457 Appalachian St., Fountain Valley, CA 92708; (Catalog $3.00). Sells a wide variety of hulls, kits and fittings from the U.S. and around the world. Probably the best selection of tugboats and related items you will find in one catalog, with excellent service.

•Working Boat Models, 27775 Melborne Ave., Hayward, CA 94545 (send SASE). Manufactures a variety of hulls for working boats, includes a Log Boat and other unusual subjects not often modeled in this country. •

SUPER CANDY *continued from page 37*

his satisfaction but the result is well worth their effort.

The hull bottom was completely reconfigured, resulting in a shallow, truncated keel which houses the full length shaft log, and a longitudinal edge chine with an incorporated kick-down along the transom edge of the bottom that is noticeable when viewed from the side.

The keel provides dynamic stability on the straight-away and good tracking characteristics in the turns. There is a slight trade off, however, greater wetted surface area (i.e. drag). Keels are a relatively common feature in full-sized boats of this ilk, but are not often seen in models.

The port and starboard longitudinal edge chine promotes sharp turns allowing tight maneuvering in close quarters.

The kick-down along the transom/bottom edge is unique and acts like trim tabs on full-sized boats, providing lift in the stern. This was Futaba's solution to the "porpoise" and planing problem mentioned by Don.

EASE OF ASSEMBLY

The Super Candy could hardly be easier to assemble. It's about as ready to run as they come, lacking only the radio system and a 7.2 volt NiCd battery. Futaba has left the radio system decision to the modeler, but the best fit (naturally) is a Futaba radio system. In our case, a Magnum Junior FP-2PB with S-148 servos was used. The servo, receiver and system battery trays in the boat are all a perfect fit and the servo throw is correct for both the throttle and rudder.

The only component (other than the radio system) that needs to be installed is the rudder, and the trickiest part of that procedure is threading the linkage rod through the transom, the rudder servo horn and the EZ connector (a potential oxymoron) on the first try.

It seems to be an industry-wide conspiracy, crossing the boundaries of model kits of all persuasions, to make the most daunting task in assembly, that of applying the decals. Once completed, the result is awesome, but the job takes patience.

The instructions reflect the ease of assembly, covering only three pages, but may be considered inadequate from the point of view of a beginner. Some mention should be made of precautions, proper procedure and periodic maintenance. Furthermore, the review model came with a detached ground wire in the speed control and no immediately obvious location for it. Although I was assured that it had never happened before, a more representative wiring diagram included in the instructions would avoid that becoming an "issue".

DURABILITY

The success of any model can be judged by the ratio of time running to time fixing. It appears that Futaba invested a lot of effort getting this one right. From the resilient ABS vacuum molded hull to the stout variable resister based mechanical speed controller, the Super Candy has been built to be used, not just admired.

There is a separate motor pan and servo/electronics tray of molded ABS plastic glued in place and an extra layer of ABS laminated inside the transom for extra stiffness. An interior deck ring with a lip-over joint is glued to the top flange of the hull to increase its integrity. An entirely separate, non-structural deck piece crowns the Super Candy and is its most striking design feature. It is attached with strips of Velcro and when in place actually does add to the overall hull strength.

On the subject of speed controllers, I've seen that component to be the weak link in too many electric-powered models. It's not all the fault of the model companies though, because newer technology has produced more powerful NiCad batteries which outstrip the speed controller's capacity. Not so in the Super Candy, which utilizes a ceramic variable resister in its speed controller to handle the extra juice. As an added precaution, Futaba has included an auto-type fuse (25 amp) and holder in the battery wire loom.

Through an ingenious design, the throttle servo activates a wiper arm to pass over the exposed windings of the resister, increasing or decreasing the resistance to a point where, at each end of the armature throw is full current flow (full speed), but at opposite polarity feed to the motor! Let's put it into terms that are recognizable; the mechanical speed controller is proportional AND reversing.

One hitch though. When reversing the power polarity to a motor it's important that the motor be timed to 0 degrees to guarantee balanced performance. Enter the Mabuchi RS-540 motor. About the most popular stock motor on the market, the 540 has a well-proven record of reliability and its timing is fixed at 0 degrees.

The drive train is direct; shaft attachment is through a polycarbonate universal with a "dog bone" style joint. This makes engine alignment (with the shaft), that is most critical in direct drives, less crucial. The universal joint will also absorb more abuse than a solid coupling. The shaft passes through a full length shaft log and terminates with a threaded end, on which is a 33mm blue plastic prop. The length of the shaft log certainly discourages water invasion and controls shaft whip, but it introduces friction on the shaft. Occasional, light lubrication will help.

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The rudder is the familiar wedge shape, attached to the transom via pintle/gudgeon design. A T-bar is attached to the top of the rudder shaft to act as the lever arm. There is no hinged, kick-up feature here because the rudder blade's alignment with the prop and keel should prevent it from striking anything (until after the keel and prop have hit it first).

CONTROL AND PERFORMANCE

Everyone wants optimum performance and sharp, responsive control out of their RC model. The manufacturer wants the same thing, too. Testing is the proof of theory. The question is, were the results of those tests used to improve the product or just used to define the product?

To explore this criteria, we'll incorporate the findings from our sea trials, which occurred in two distinctly different venues.

The supreme test of control may be that of maneuverability. If so, then the first site where we splashed the Super Candy provided the perfect setting, my backyard pool. Typically, it is where I perform the christening rites on all of my review projects; to prove hull integrity, and at-rest trim (i.e. floats upright). In the case of the Super Candy, we were able to take it a step further, full running tests. Although it didn't provide a great enough fetch to test top speed, the Super Candy was able to maneuver handily within the confines of my irregular shaped, medium-sized pool.

The main drawback of such a small body of water is that the surface becomes choppy with uneven wave direction from the refraction of the wake off of the pool sides. But that too became a challenge that the Super Candy proved up to. Stability and quick response verified a positive result in the control aspect.

It was time to see if the Super Candy could make the transition from pool to pond. In this case, the Pacific pond. With test pilot in tow, I went down to a dock on the bay. The surface was barely rippled by the light breeze, the sun slightly past its zenith. I had applied the recommended clear plastic wrap for additional water proofing. One lesson I had learned in the pool was that when running in reverse, water pooped in over the transom, and since salt water attacks electrical components a lot faster than fresh water, I wanted the extra protection.

Loaded with a freshly charged 7-cell pack of Panasonic P-170 SCR batteries, the Super Candy slid into the water, the skipper pulled the trigger and off it shot. Almost instantly it came up on plane with perfect trim. No porpoises in this body of water!

At full speed, which is in the 12 to 14 miles per hour range, I asked the captain to execute some hard-over turns. Leaning into a turn that it cut like a razor, and throwing a surprising roostertail, you could sense the centrifugal force trying to break it free of its intended course. But the Super Candy held true in whatever direction it was pushed.

After about eight minutes of hard running, the batteries started to dump so we brought it back in. I pulled the lid and felt the motor and speed controller. They were bordering on hot, but not burning. After adequate cooling time, we switched to a six-cell battery pack and just had fun for the next eight minutes. Run time was not diminished, but top speed dropped a few miles per hour. Allow me to point out that Futaba recommends using a 7.2-volt battery pack (6 cells).

One thing I did notice was that the boat turned better to the left than to the right. All things being equal, it's usually the other way around, mostly because of motor torque. Upon closer inspection I noticed that the rudder was offset by about 1/8 inch. No big deal, but in the tight confines of a pool, you may be bouncing off the walls more while running a clockwise course.

AFFORDABILITY

Our final criteria by which to judge this model is pricing. The suggested retail of the Super Candy is $169.95, the Magnum Junior FP 2-PB is $119.95. In the realities of today's marketplace and in light of fierce competition everywhere you can probably get the whole package for less than the suggested retail of the Super Candy. Still, for many it's a little high priced, but you know what they say to those who buy cheap, "The price paid is quickly forgotten but the dissatisfaction of an inferior product lingers."

The Super Candy is not a scale model of any existing full-sized boat. That can be a disadvantage because there is no name recognition to play upon, but there is not the tendency to call it "good enough" if it merely looks alike. Given a free hand to experiment, appearance and performance have received a greater share of attention in the development of the Super Candy.

I hate to brand this model "entry level" because there is plenty of fun to be had with it by the experienced. There has been no discussion about the hop-up potential, but I would say there's another 10 miles per hour lurking somewhere in that hull. Besides, it's so versatile that the only body of water it can't be run in is your bathtub.

Attractive styling and distinctive graphics catch the eye, steady performance and durable construction will win the heart, of the beholder. The Super Candy is destined to become a popular and lasting member of the House of Futaba. •

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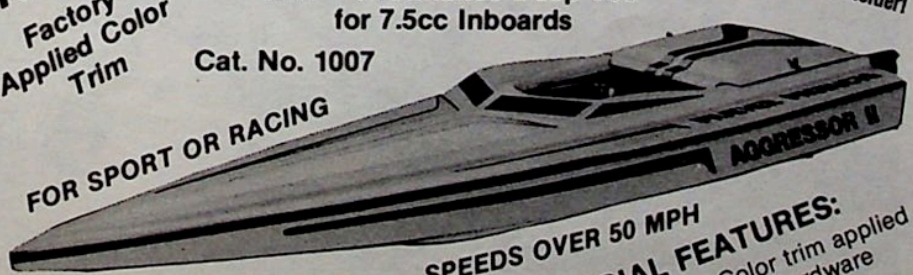

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The running hardware kit will bolt directly on the pre-drilled transom of the Aggressor II. The kit features: sharpened s.s. strut, machined aluminum rudder, s.s. racing fin, strut & rudder brackets, brass shaft log, 3/16" flex cable, s.s. trim plates and all s.s. bolts, nuts & washers.

WEDGE RUDDER
Without Water Pick-Up★ Cat. No. 8053
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★This competition proven machined aluminum rudder is included in the Aggressor II hardware. Can be fitted to most hulls with the use of the Rudder Bracket Extension.

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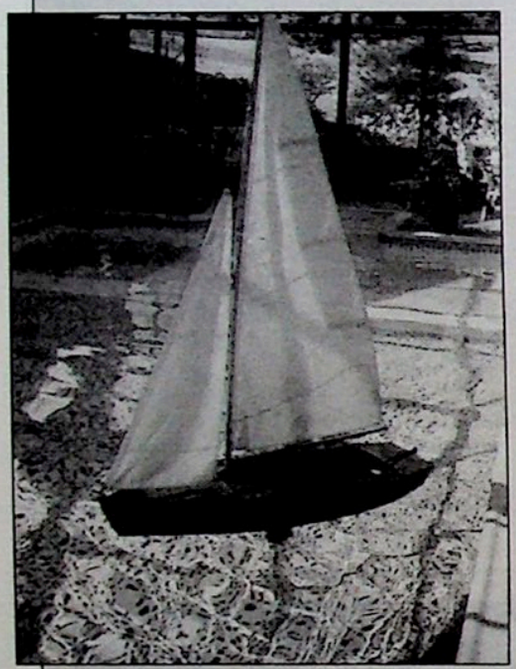
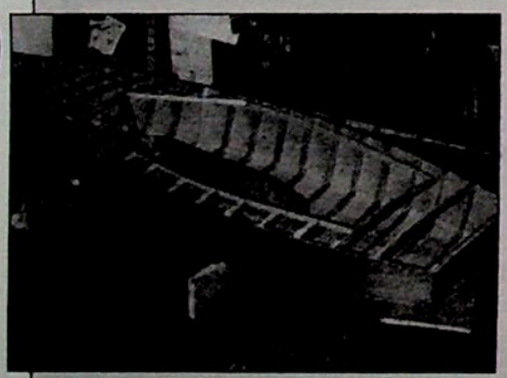
STRICTLY SAIL

BY ROD CARR

READERS SHARE PROJECTS

A good portion of the mail that I receive comes from skippers who are located outside of the metropolitan areas where model yacht clubs are likely to be found. By sharing their projects with me they are really announcing their interest and it is up to me to announce their location. So this month we have a series of completed boats from skippers across the country. Should you live within hailing distance, get in contact two boats on the water are a lot more fun than just one!!



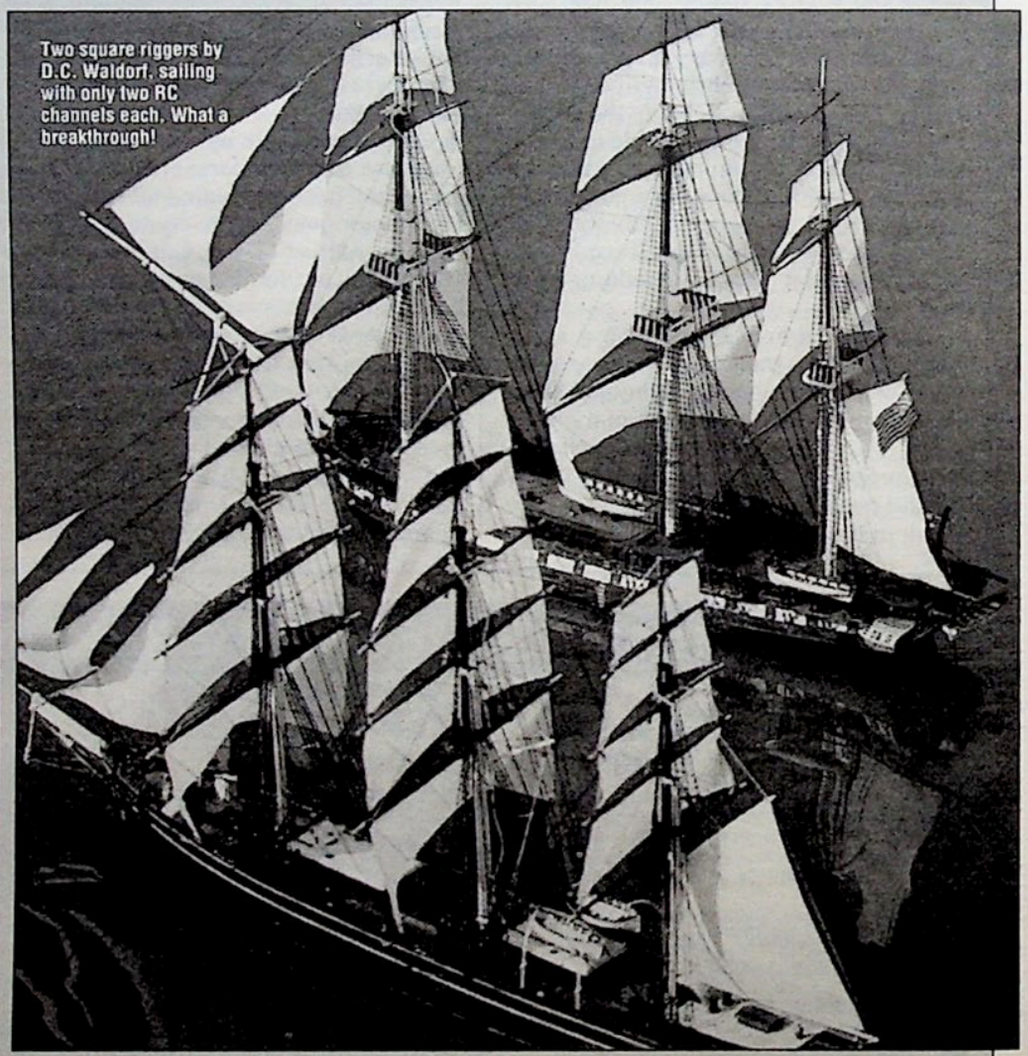


Karl Arbogast's Lightning class sloop was built from Craig LaChance's article in the Spring 1988 *USB&SM*. Karl's sloop shows careful attention to detail and appears to have used scale-sized timbers in her framing.

Our first photos are of the 1/4 size Lightning Class sloop that was featured in USB&SM in the Spring 1988 issue. Karl F. Arbogast, Jr. (P.O. Box 268, Dallas, PA 18612) reports that the construction took 2-1/2 years of part-time effort. His attention to careful construction is obvious in the photo taken before the deck was put on.

• • •

Having had the opportunity to sail both ways across the Atlantic on the Coast Guard Academy's barque *Eagle* in my younger days, I have always kept an eye out for modelers who were experimenting with square rigged models. Our next set of photos shows off the work of D.C. Waldorf (P.O. Box 702, Branson, MO 65616). Well aware of the complicated rigging problems associated with bracing the yards of the square sails so that the boat could be made to sail closer to the wind, a simpler more reliable solution was devised. The yards were removed from the standing masts and attached to stiff, small diameter tubing that was placed in front of the masts. The tubing could then be rotated to port and starboard allowing the boat to sail within 90 degrees of the true wind direction.



Two square riggers by D.C. Waldorf, sailing with only two RC channels each. What a breakthrough!

There is sufficient complexity in the standing rigging of the models to nicely camouflage this extra bit of structure. Even the push rods and arms do not look obviously out of place in the close up photos provided. All tubing masts rotate together as a

result of the action of only one RC servo. You can see the servo arm neatly mounted to the top of a convenient deck house just aft of the foremast in the right side of one photo. Jibs and staysail sheets are led to the centerline of the boat. They work symmetrically on either side of the wind as on most sloop rigged RC yachts.

• • •

If you have an interest in an ocean racing scale style of model yacht for sport sailing, consider the Sundance 43, manufactured by Ed Brown (10717 S.E. 178th Street, Summerfield, FL 34491; 904-347-3651). An overlapping genoa jib is available and shows off the hard chine sloop to advantage in light air. He produces individual hulls and components, all the way to a ready to sail version for $949!

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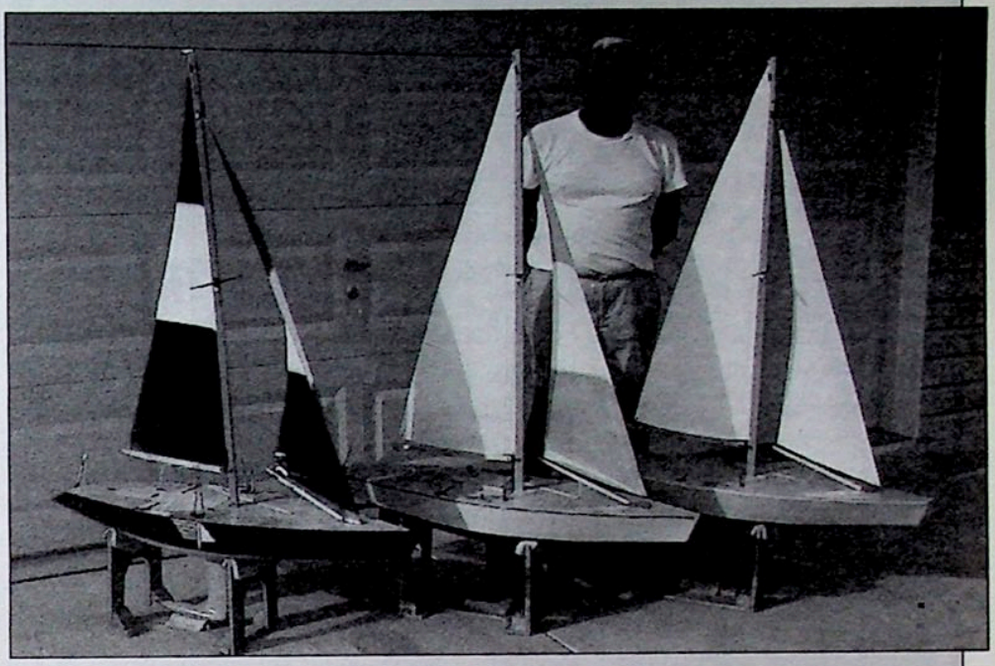
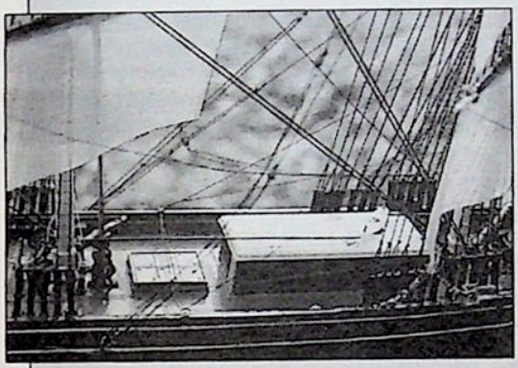
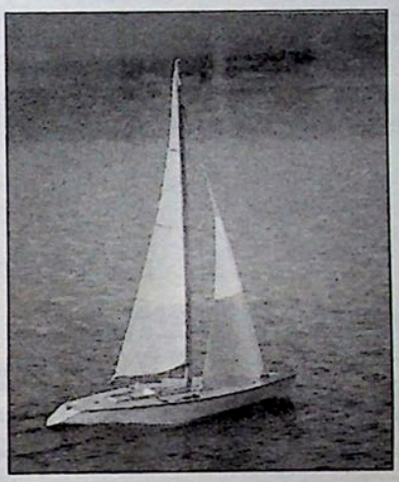
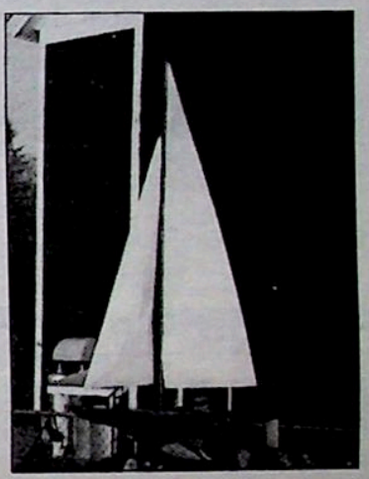
Bob Clay (20 Gilmore Ave., Cambridge, NY 12816) sends a report on his restoration of what must be a 10-rater class model built back in the mid-30's. The

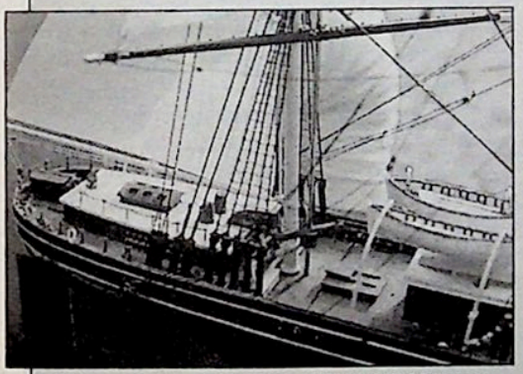








■ ABOVE: Ed Brown and his Sundance 43 sloops. ■ FAR LEFT: Genoa jib on the Sundance 43 makes good light performance and a scale appearance. ■ LEFT: Vintage 10-rater of Bob Clay is ready for new sails and an eventual re-launching.



Tube masts carry the yards and are rotated by servo driven linkages. Mizzen mast rigging effectively masks the tubing masts.

photo shows the overall arrangement with paper sail patterns hoisted for checking dimensions. A new rudder has been fitted near the transom. From other boats of this type that I've become familiar with, I will predict that Bob will eventually be able to make the rudder smaller, and move it somewhat closer to the center of the boat with even increased control.

The keel photo shows that the hull was built up in the "bread and butter" style of 3/4" planks glued together in a horizontal stack, then hollowed out on the inside and smoothed on the outside. The keel has undergone modifications as the new

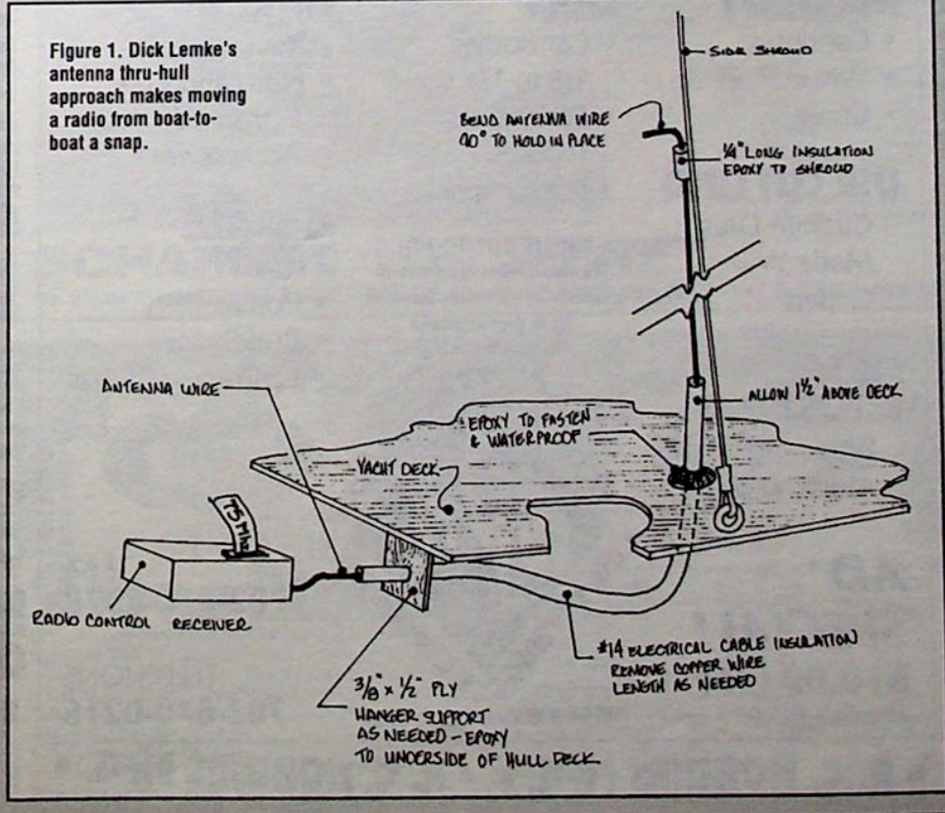

SIDE SHROUD
BEND ANTENNA WIRE 90° TO HOLD IN PLACE
¼" LONG INSULATION EPOXY TO SHROUD
ANTENNA WIRE
ALLOW 1½" ABOVE DECK
EPOXY TO FASTEN & WATERPROOF
YACHT DECK
RADIO CONTROL RECEIVER
#14 ELECTRICAL CABLE (INSULATION REMOVE COPPER WIRE LENGTH AS NEEDED
3/8" × ½" PLY HANGER SUPPORT AS NEEDED - EPOXY TO UNDERSIDE OF HULL DECK

Figure 1. Dick Lemke's antenna thru-hull approach makes moving a radio from boat-to-boat a snap.

piece of deadwood announces behind the odd shaped lead ballast. Almost all ballasts of boats built in this era were flat on the top and then sloped at an angle to the bottom of the keel. I'm sure that the original boat had the rudder attached to the back of the keel, just about where the hand is supporting the hull in the photos. Conversion to R/C may have required a reduction in the amount of lead to make up for the weight of the radio gear, sail control unit and batteries. I produced some snow-white 2 oz. Dacron sails for Bob and am looking forward to seeing this grand old lady on the water again.

• • •

I am pleased to report the availability of a new sail control unit. Martin Larson (4002 N. Washington, Spokane, WA 99205) is producing a heavy duty bead-chain winch for use in some of the larger classes of yacht. The output shaft terminates in a special sprocket or sheave that has indentations for a bead- chain. One mounts an idler sprocket in the bow of the boat and runs an endless loop of chain around them. Sheets are tied onto the bead-chain at appropriate locations and results in a system that is almost impossible to foul. Control is through an RC servo driven double-pole, double-throw switch with a six-volt power pack recommended.

At 17 ounces, the unit is not a lightweight, but the size of the motor indicates that it will be capable of handling even the big AC Class models. Contact Martin at the above address for further details.

• • •

A very effective antenna thru-hull routing has been developed by Dick Lemke (1460 West 17th St., Hastings, MN 55033). His description follows below and the configuration is easily seen in the drawing.

While working on a 36/600 model, I was faced with the problem of an antenna thru-hull fitting that would allow the antenna wire to pass thru the deck, be watertight, and yet allow the antenna wire to be removed when the radio board was shifted to another model. Other skippers may find this to be a workable idea. It basically involves stripping and using the insulation from #14 household wire to serve as a guide and tube for the antenna wire so that it can be routed up a side stay or shroud.

1) Obtain an appropriate length of #14 standard household electrical cable (6-8 inches).
2) Remove outer casing of wire and discard.
3) Select one of the insulated wires, black or white (or red if using 3 wire cable).
4) Carefully remove approximately 1/4 inch of the insulation from one end. Save this piece.
5) Grip exposed copper wire with pliers or ViseGrip and gently work remaining insulation off the copper wire. Save the insulation, discard the copper wire.
6) Locate and drill a hole through the deck approximately mid- way between mast and side shroud. Use a 9/64" diameter drill.
7) Insert the insulation through the deck, leaving a minimum of 1-1/2 inches above the deck.
8) Use thickened epoxy to glue/seal around the deck/insulation.
9) If the tube will have a long run under the deck, consider making small hangers from scrap pieces of plywood. Drill 9/64" holes through the ply and epoxy them to the underside of the deck, routing the insulation through the holes. A few dabs of epoxy will keep the insulation from shifting.
10) Insert and thread the antenna wire carefully from the receiver into the insulation. Push gently on the antenna wire until it emerges from the end of the insulation above the deck. Gently pull antenna wire until it is straight. Don't pull too hard or it may damage the receiver/antenna connection. Determine where the end of the antenna wire will come on the shroud. Mark this point with a small piece of tape.
11) Take the small 1/4" piece of insulation removed in step #4 (above) and epoxy it to the shroud wire approximately 1/2" below the tape marking. This becomes the antenna attachment point on the shroud.
12) Feed the antenna wire through this small piece of insulation and with your fingers, bend the antenna 90 degrees to hold it in position. The antenna wire will remain vertical and alongside of the shroud, but still can be easily removed for work or transfer of the radio to another boat. Antenna wire can be spiraled around shroud wire if desired, before inserting through the small insulation piece on the shroud. (Spiraling may reduce antenna efficiency, but this is usually not a problem with model yachts. Make sure to do a complete range check before sailing, however.-RAC)
13) A small dab of petroleum jelly can be placed at the top of the insulation tube where the antenna wire exits. This will provide a measure of waterproofing for those whose yachts tend to suffer from "knock-downs". If a permanent installation is wanted, simply substitute epoxy for the petroleum jelly—keeping in mind the difficulty of antenna wire removal if required."

Many thanks to the skippers who took the time to share their projects with us. If you are in their local area, look them up. It is much more fun at the pond with two or even more boats. Photos, comments and anything else is always welcome direct to: Rod Carr, 3011-177th Ave. NE, Redmond, WA 98052. •

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HARBOR BOATS cont.from page 21

The "spoonbill bow" has a slightly rounded hull with the bow rake shaped like the contours of a spoon. The "model bow" has a "V" shape to the bow rake. It can be a "V" shape that contours the hull bottom or a "V" shaped bow rake that "runs out" to form a flat bottom. A "modified" hull has characteristics of more than one type of hull design. It usually has a scow or spoonbill type bow with a chine connecting the sides to a flat bottomed hull.

I like to use this type of modified hull for RC towboats, especially harbor boats. The flat bottom allows placing the model down anywhere without the need for a stand. The chine of the hull acts as a type of keel, which aids in keeping such a short model running straight. Real harbor boats will "wander" every where when running light boat because of the mass of water the bow pushes in front of it. A small boat is much easier to handle while pushing a tow. I've been told that handling a harbor boat is harder than handling a large towboat without a tow. The reason being that a long towboat will drift fairly straight to where a short harbor boat will turn sideways with the current. I've watched many harbor boats listing sharply while turning. Often I have wondered what keeps them from capsizing.

On board, most of the time you don't notice the listing while turning until you align the horizon with the flagstaff. It's amazing how maneuverable these little vessels are. They can turn within their own length. It feels like you're standing in the middle of a merry-go-round when they pivot around. The draft of a harbor boat can run as shallow as three feet or to a depth of eight feet. Most harbor boats have a draft of seven feet while most line haul boats have a draft of nine feet.

This concludes my follow up article on harbor boats. I hope to have expanded interests in inland river vessels and answered questions about towboat for modelers already interested in them. Some day I hope to see clubs and model boat regattas based upon towboats such as the tugboat clubs out West. Bill Zumwalt and I have had a lot of response from readers interested in plans and scratch-building techniques. Keep those letters comin', we enjoy hearing from fellow modelers.

I want to express my thanks to Frank and Albert Boggs, Gerald Piece, and all the crew at Boggs Landing for the boat trips and research information on harbor boats. Without their cooperation this article would not had been possible. To all of you who have an interest in modeling boats, may all your projects be successful and enjoyable. As the sign on my wall says; "GET PUSHY...build an R/C towboat." I enjoy hearing from others, you can write me: Joe E. Brown, 1010 Turley Ave., Flatwoods, KY 41139. •

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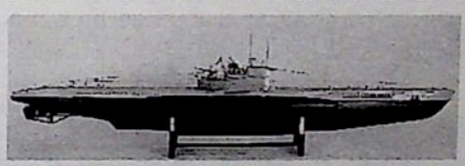

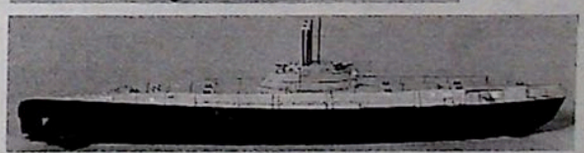

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SHOP TOOLS REVIEWS & HINTS

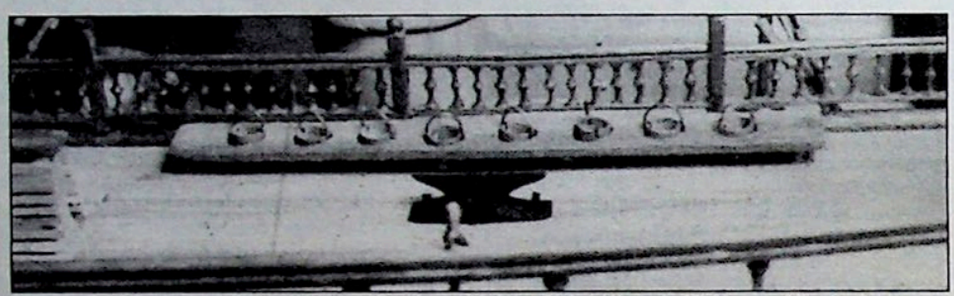
BY SCOTTIE DAYTON AND RICHARD YOUNG

MAKE RAILINGS FAST AND EASY

Just the other day I was again asked how I made the railings on my 1/4-inch scale model of the Great Lakes paddlewheeler *Michigan*, so I guess it's time to write down my procedure.

The upper and lower bar rails were birch capped with a black walnut half round moulding. Stanchions were turned from black walnut.

To make the balusters, I sawed a 1/16-inch square strip of black walnut and cut it into two-inch lengths. One piece at a time was chucked into my Dremel flex-shaft handpiece mounted in a vise. I rounded 5/8-inch of the square stock by slipping a drawplate over the wood while running the Dremel. The reason I used the Moto-tool instead of my jeweler's lathe was because the former's four-jaw chuck aligned the square stock better.



An example of the intricate railing work described here; this is on Richard Young's *Michigan* paddlewheeler.

Starting 1/4-inch in from the outer end and while the machine was running, I filed a groove as thin as I dared with a half round diemaker's file. I made another groove 1/4-inch in from the first one. The baluster was parted off 1/4-inch in from the second groove. Then I fed out more stock from the chuck and repeated the entire procedure until the pile of balusters seemed sufficient.

With my dividers, I determined the length of my railings and locations of the corner posts. Tick marks were made on the deck to indicate where each stanchion would go.

Now came the fun part. To make the railings, I cut a piece of yellow birch 1/4-inch thick and as wide as the distance from the top of the upper rail to the bottom of the lower one. Length was about a foot long for ease of handling. Using a 1/8-inch Dremel bur as a router and my drill press as a milling machine, I routed a 3/16-inch deep channel in the center of the strip, leaving enough stock for the top and bottom rails. Scale length of the rails was one inch plus a little leeway. I ticked off this distance on my strip. My rule of thumb is to make half again as many pieces as I think I'm going to need to accommodate breakage or rejected parts, so I machined that extra number while everything was set up.

Tipping the strip on edge, I used my drill press to bore holes through the top and bottom rails. My bit was the same diameter as the balusters. Leaving one bit width after the first one-inch tick mark, I started drilling holes as close to each other as I could get without breaking out the wood between. Drilling ceased one bit diameter short of the next tick mark. This process was repeated on all the strips, being sure to get the same number of penetrations in each one-inch long section.

Next, I took a baluster from my pile and stuck it halfway into the first hole in a strip. With a toothpick, I placed a dab of yellow carpenter's glue (aliphatic resin) from the channel side into the bottom hole. I pulled down the baluster just enough to make room for a spot of adhesive on the top of the upper hole, then positioned the post. So it went until all penetrations were filled. Since the balusters were made a little long, I trimmed them flush with the railings, then sanded smooth.

A 1/16-inch-deep groove had to be cut on the top rail right through the middle of all those balusters. This was accomplished with fences to hold the strip upright and a Dremel 1/32-inch round bur in my drill press.

The stock remaining at the back of the channel was removed using a thickness sander. (If the rail looks a little wide, sand off the front face first until the proper width is achieved.) The tiny channel pieces between the balusters will come loose with sanding, but won't fall out. I carefully extracted them using a fingernail.

Occasionally, I had to sand a little more to bring the strip down to its scale width. Sanding flash was removed with a knife. Standing the strip on edge, I separated the inch-long sections by first cutting through the top rails with a knife, then flipping the strip over and freeing the bottom ones. Ends were finished as I used them.

To make the cap rails, I drew 1/16-inch square black walnut through the drawplate down to the diameter of the balusters. I'd sawed these strips while making stock for the posts. Cap rails were cut a little long, then mated to the groove on the top rail with yellow glue. Once the adhesive dried, the ends were trimmed flush.

Stanchions were 3/32-inch square black walnut. Using the same method as previously mentioned, I rounded 1/8-inch of the stock. This was the peg that would seat into the deck. With my divider set at the length of a stanchion, a mark was made using the shoulder of the peg as my starting point. Above this mark, I filed a 3/32-inch tall finial shaped like an acorn. It was as high as the stanchion was square. The completed post was parted off using a diemaker's file. I repeated the procedure until more than enough parts were manufactured.

Installation began by drilling a hole for one corner post. I selected a stanchion, test-fitted it in the hole, then cut two nicks in it to accept the upper and lower rails. On the adjacent face I cut two more nicks then glued rail sections to the post. Using the pencil marks on the deck as a guide, I double checked to make sure my rails were the proper length before boring penetrations for the next two stanchions. The corner post wasn't permanently installed until I was certain all stanchions were equidistant from each other. Finally, notches were cut in the remaining stanchions to accept the rails.

It's important to glue the initial corner post and adjacent stanchions at the same time, because there isn't room to bend the railings into their notches once the posts are secured. Remaining stanchions were installed one at a time, then the railings cut to length so they could be slid in from the side for a snug fit.

Michigan had numerous companionways and the railings for them were fashioned the same way. The only difference was that I made a fixture to hold the strips at the proper angle while I drilled the holes. Railings were finished with several applications of sprayed on Deft Wood Sealer to protect the wood.

The beauty of this technique is that it's fast and easy, because the balusters hold the rail sections together, making a strong, uniform assembly. Try it and I know you'll agree.

continued on page 61

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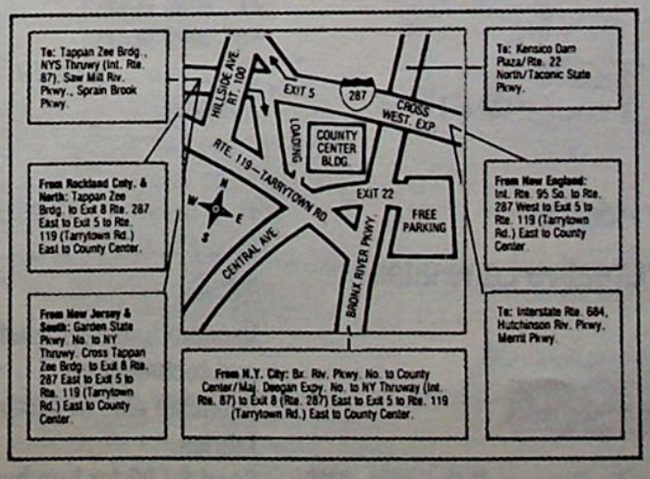
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COMBAT *continued from page 28*

opposing ship and firing begins. After a little experience, this becomes second-nature and happens very quickly. While having an elevate control on BB cannons is allowed by IRCWCC rules, very few people use it. The action of a battle is so fast-paced that there is usually not enough time to utilize bells and whistles, just basic aim and shoot.

Myth: "The turrets rotate don't they?" By the rules of Model Warship Combat, only certain classes of ships are allowed to use rotating turrets. This does not necessarily give them a big advantage. In some cases, turret rotation is allowed mainly to keep a ship from being heavily disadvantaged, such as the French Jean Bart which had only two main battery turrets. Other ships which are allowed rotate are those that are very long and tend to be less maneuverable than some of the shorter models. Most of the ships which are most competitive do not have a rotating turret, even some which are allowed to by rules.

"Why can't the smaller ships have cannons that shoot off the side?" The answer is Safety. Smaller ships tend to be less stable on the roll axis. They tend to roll several degrees from side to side when making turns and especially when taking on water. If they had cannons aimed off the side it would be much more likely that they could fire at a high angle which could send BBs to face level of Captains and spectators. The larger ships are heavier and wider, making them more stable on the roll axis.

"How do you aim the cannons/ship when it is far away on the water?" Practice, practice, practice. That is why 99.99% of the battling takes place within 50 feet of shore. This allows the captains to reliably judge distance, angle, and effectiveness of their firing.

"How far away can you shoot another ship?" A good BB cannon will penetrate another ship's skin out to about 50 feet, but only rarely will any battler attempt a shot that far away. Due to the necessity to judge angle and distance, most shooting takes place with ships no more than a few feet apart.

Are the BB cannons dangerous?" Safety is a major concern of battlers and is addressed by the rules of IRCWCC in two primary ways. First, all competitors and spectators must have approved eye protection with wrap around side shields to be allowed in the pit area. Second, every firing BB cannon has a hole drilled through the barrel and a steel hitch pin clip inserted crosswise any time the ship model is not floating on the water. This prevents accidental discharge of a BB at an unauthorized time and place.

Power of these BB cannons is low, usually less than the power of a typical air gun. Captains and spectators will occasionally be hit by BBs that come in over the shore, but a sharp sting or small welt is the only result. In the 13 years I've been associated with IRCWCC I have never seen or heard of a serious injury involving these BB cannons.

Myth: It worked at home, why doesn't it work at the lake"? Truth: This is one of the most common forms of "rookie-itis" evident in RC warship combat. These ships are no more complicated than any other type of RC model, just different. Even someone who has had years of RC experience in planes or speedboats needs time to learn all the little tips and tricks that make a warship reliable. This can only be learned with the ship on the water, in practice, not on the workbench.

Fantasy: I want to build a battleship for my first model warship". Fact: Big mistake! BIG, BIG MISTAKE! Too many people are enamored of the term "battleship." These ships are indeed the "big guns" of the fleet, but they are NOT for the rookie captain. By far the most practical ship for a beginner in this sport is a cruiser. These ships are much smaller, cheaper, quicker to assemble, much lower maintenance, and easier to learn on than the bigger ships. A captain will be on the water having fun and learning basic tactics and valuable reflexes much quicker

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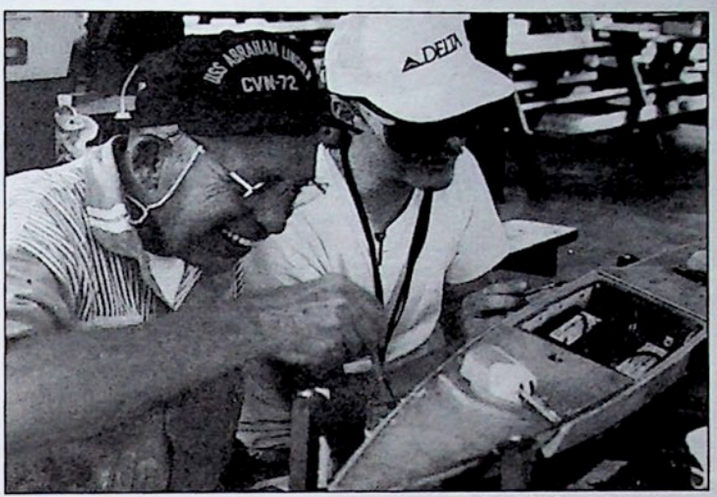
with a cruiser. This knowledge can later be used to make an intelligent decision about which battleship to build. I have seen too many rookies come into this hobby with a battleship only to be quickly discouraged because they lacked the reflexes and battling tactics to be effective. A rookie on the water with a cruiser, using cruiser tactics, stands a fighting chance, a rookie with a battleship is classed as "fresh meat" by the old timers and is singled out for numerous pastings. They just don't have the experience to compete with the old hands Captaining the big ships and many never come back for their second season.

Fantasy: "I have a great idea for a new type of cannon/pump/throttle/etc., that will just blow the other guys away!" Reality: This is the second biggest case of rookie-itis, new battlers who are all starry-eyed over possibilities to experiment and tinker with new hardware designs. While there is a lot of room in this hobby to experiment, new guys seldom have knowledge of what works and what doesn't to improve on the existing technology. Chances are they will spend months and in some cases years trying to re-invent the wheel, ending up with something that either does not do what they envisioned it would, or does not work at all. In the meantime they get their clock cleaned every time they battle.



"Jerry's put up a jolly good fight last sortie, don't you think Suh?" Sub-leftenant Steve Baker (right) gets help patching *HMS Invincible* from Capt. Tom Jass of the *Marlborough*.

New battlers should concentrate on copying proven designs so that they can get onto the water and have fun, learn what works, what doesn't. Watch the Captains who win consistently, build and battle the same way they do, then if they see a need for improvement they can experiment. This will lead to much more fun and much less frustration in the long run.

Myth: The guys will have mercy on me for my first few battles". Fact: "Mercy" is in the dictionary somewhere between "Massacre" and "Murder." Captains in this hobby are among the most helpful and friendly around when the ships are not on the water, but as soon as battle has been declared, there are no holds barred. A rookie whose ship does not perform up to standard is going to get the same treatment as if he is a ten-year veteran. In other words, he goes swimming a lot.

This rough treatment is all in fun, of course. Cameraderie is prevalent at every contest. Battlers are always helping each other out, kidding, talking ships, and socializing between battles. The idea is, help the guy in trouble, if his ship is not operational, you can't shoot at it.

Conclusion: There are a lot of misconceptions about this hobby, but I feel that over time, as more and more people become involved and the general availability

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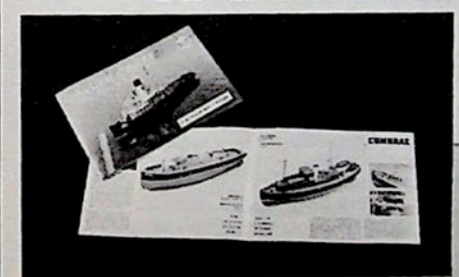

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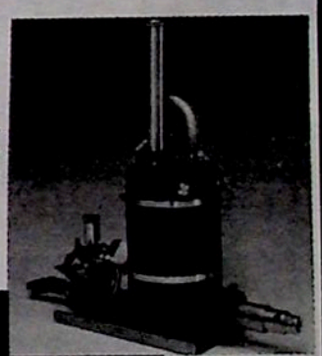

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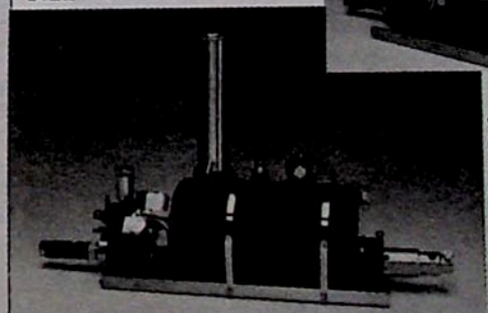

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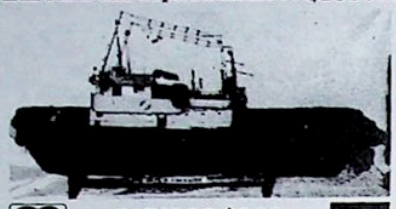

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of knowledge about RC Model Warship Combat increases, this will change. While it is still a comparatively small hobby, it is growing, especially now with the availability of kits made just for the hobby.

If this sport/hobby is something that you are interested in, I would suggest that you contact the clubs dedicated to this "Magnificent Obsession" for more information.

Contacts for the International RC Warship Combat Club: For membership information, the Club treasurer, Mr. Francis Rogowski, 7505 Furnace Branch, #C, Glen Burnie, MD 21060. For a subscription to the club's bi-monthly newsletter send $6.00 for six issues to Hull Busters, c/o D.W. Fluegel, 3524 Gray Drive, Mesquite, TX 75150. This little scandal sheet is full of useful information concerning technical hints and tips, upcoming events, reports of recent events, who's doing what to who, gossip about the enemy, a directory of local clubs and contacts around the country, and you name it. A real bargain.

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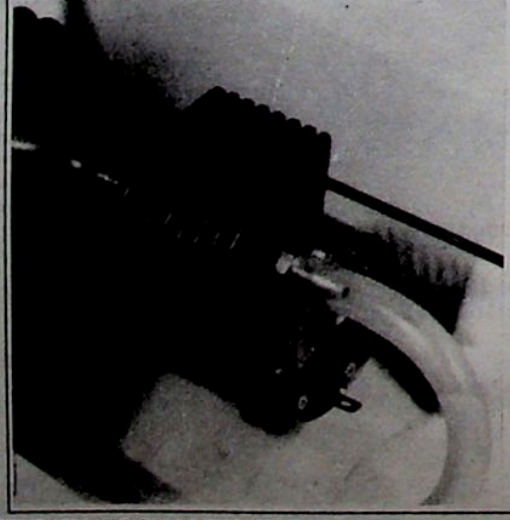

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BUILDING A TUG *cont. from page 13*

finished product.

The pilot house windows were framed with strip styrene, with clear plastic for the window itself. After the cabin and pilot house openings were finished, they were primed and painted. Following this, the widows and ports were installed.

The stack was a Scale Shipyard casting that need only the seam sanded, and the cap installed. The cap was a particularly nice resin piece, complete with exhaust pipe for the engine. A 1/4" plexiglass plate was bonded to the inside of the bottom of the stack; this was drilled for a #10 bolt. A matching hole was drilled in the cabin and, after painting, the stack was installed inside the cabin with a wingnut.

For the logo on the side of the stack, vinyl 1" letters were stuck onto a sheet of .030 plastic. The plastic was cut and filed to the outline of the letters, which were then peeled off. Following priming and painting the logos were fixed to the side of the stack with Zap.

The masts were the next item to be fabricated. I wanted them to be removable for transportation, yet still be able to carry lights. I also did not want to fuss around with small plugs every time they were removed. I achieved this by making masts plug into sockets created from brass tube and strip to carry the positive and negative lines. The masts themselves have a brass outer tube separated by an acrylic section from a brass button on the bottom. When inserted into the sockets on the deck, they make contact with the boat's electrical system.

After a few design changes, the system has worked well, although it is necessary a couple of times a year to lightly steel wool the contact surfaces to assure continuity. The body of the masts are hardwood dowels tapered on a lathe, as are the crosstrees. They were stained and finished with Deft.

The running and towing lights were turned from acrylic rod, drilled to receive 1.5 volt lights and mounted on small

continued on page 62

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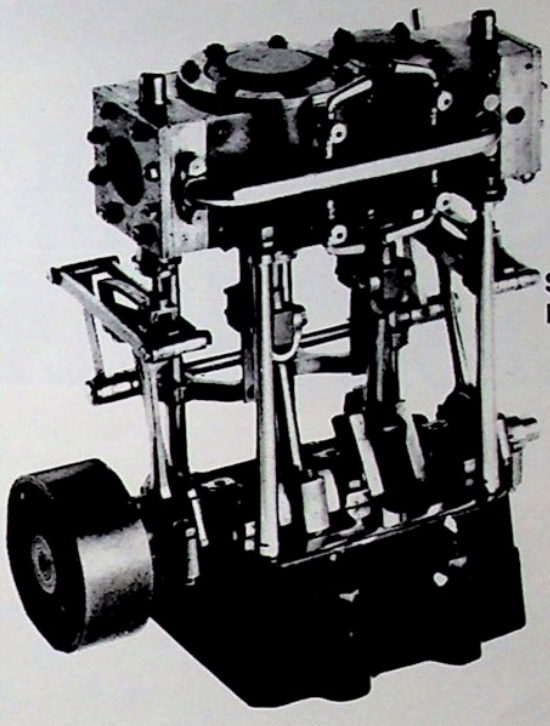

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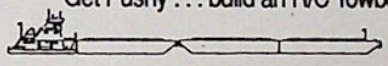

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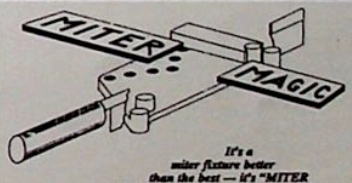

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BY BEN CONNOR

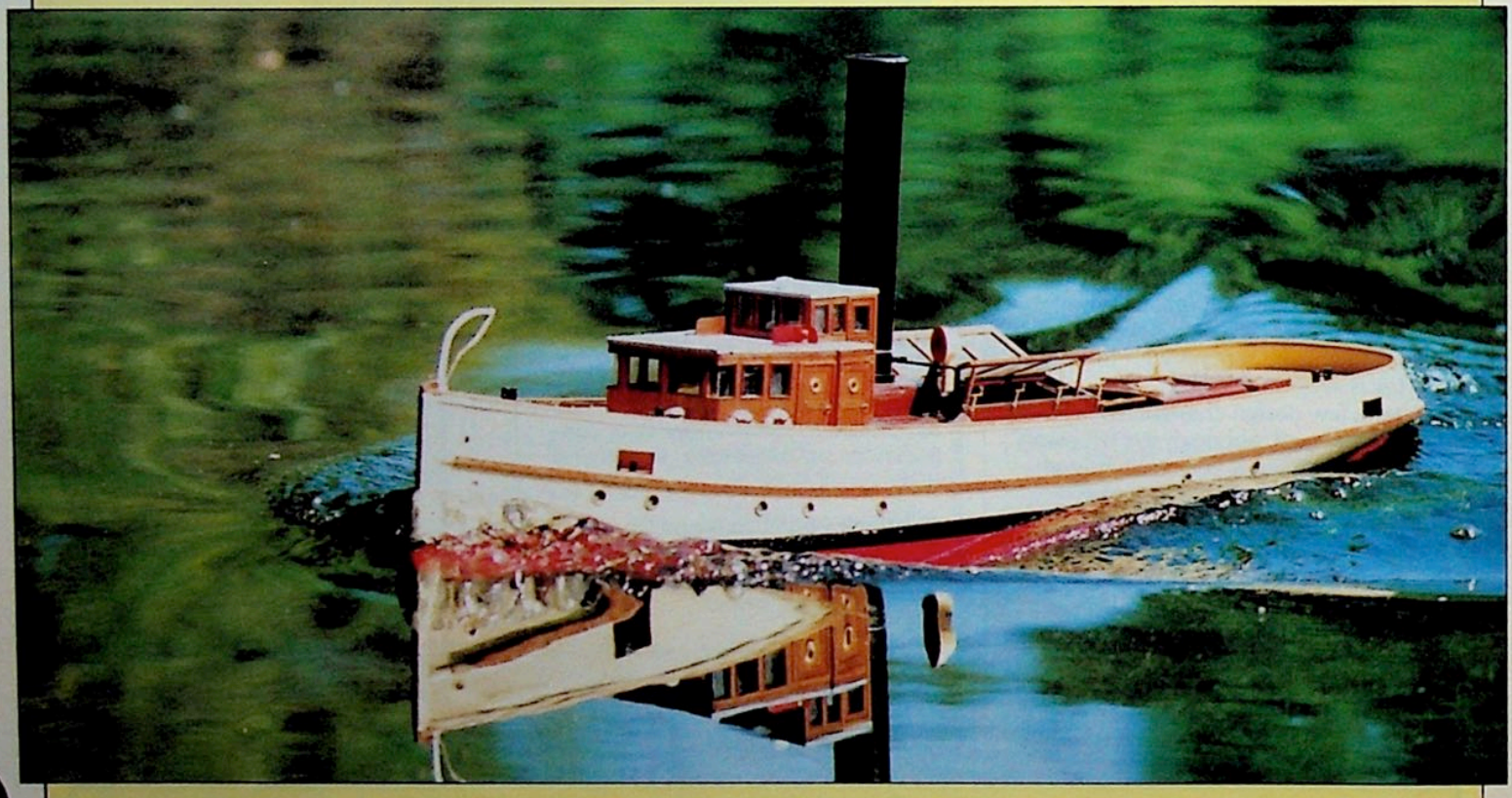
MARINE MODELS OF DIVERSITY IN DELAWARE

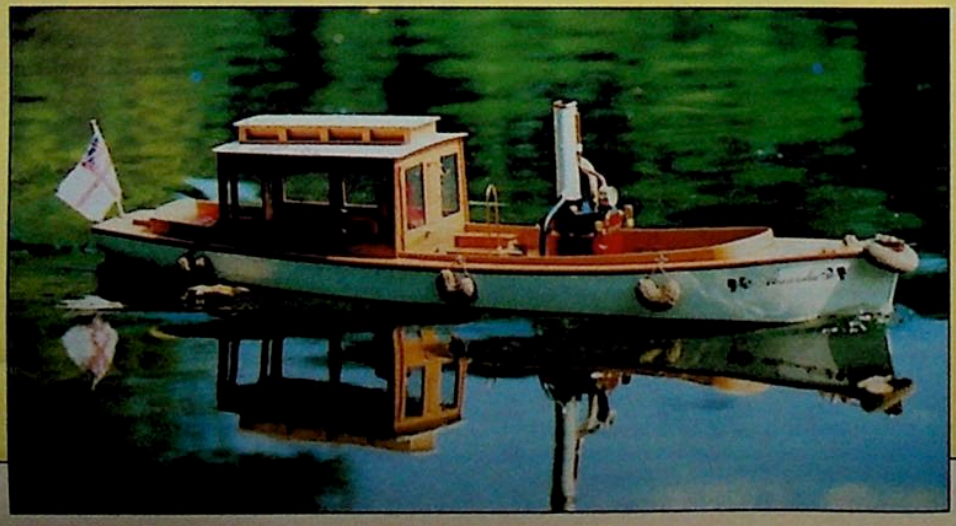
Late summer's warm September weather seemed like a perfect reason for my wife and me to spend a week at eastern shore Maryland's Ocean City. Our route east took us right by Seaford, Delaware, the new home of Aeromarine Laminates. A couple of days later I took a leisurely 45-minute drive back to their shop and spent a half day touring their new 9800 square foot facility, snapping photos and talking boats.

I had seen many Aeromarine racing boats before, as they are very popular here on the east coast. I'd guess their catamarans are the most popular, but their monos are well represented at most races, too. What I didn't know is that they make many hulls for scale boats as well, and now are the U.S. distributor for Calder Craft scale model boats and Cheddar steam engines, both of which are imports from Great Britain.

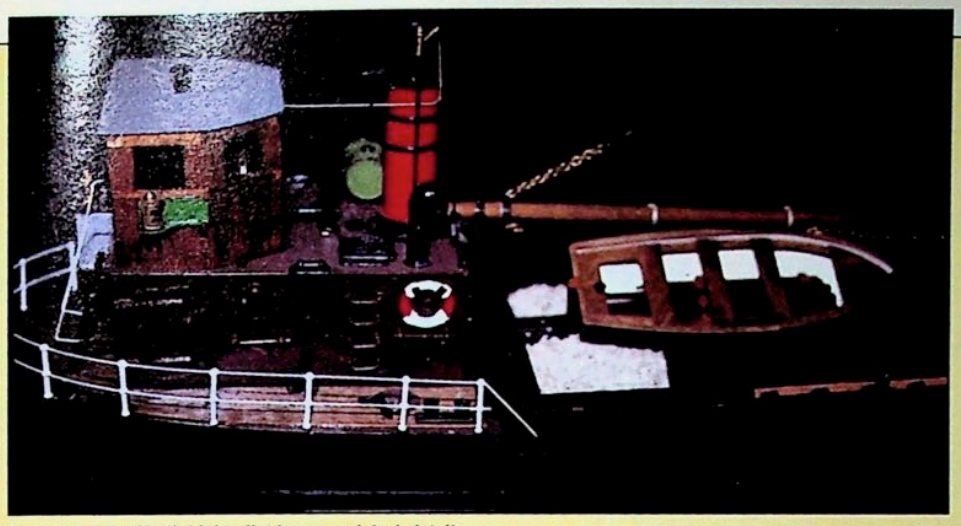
The 19 kits available from Calder Craft range from a non-scale military patrol boat for younger modelers through scale tugs, freighters and work boats. They include a scale PCF or "Swift" boat from the U.S. "Brown Water Navy" in Vietnam, and a British fireboat from the World War II era.

They had one assembled Calder Craft





Two model boats being propelled by Cheddar steam engines.



Close up of the North Light pilot house and deck detail.

One of the interesting parts made by Aeromarine Laminates—a boat driver complete with orange life vest.

model on display which immediately drew my attention. It was the North Light, a "Clyde Puffer" which is a representative model of a coastal freighter from the Western Isle of Scotland. I couldn't help but admire the deck detail. Other folks have obviously liked it, too, as it was the first marine model kit to ever win a gold medal at the Nuremburg Toy Fair. Calder Craft has a nice catalog with photos showing each model available.

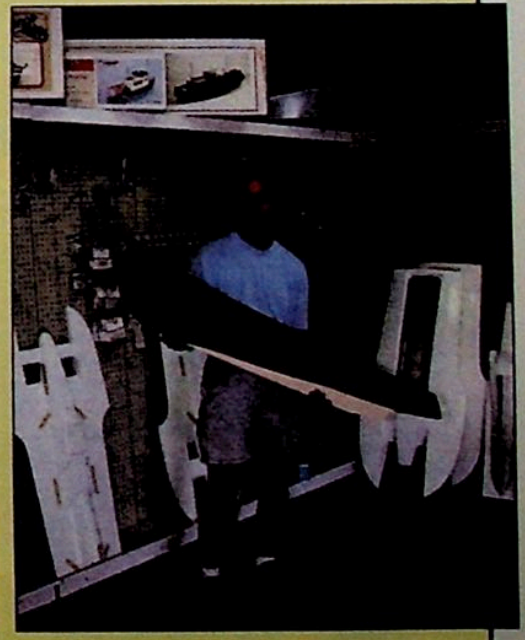
The other fact I did not know about Aeromarine Laminates is that they make an extensive line of hardware and parts for model boats and engines. I was surprised by the huge machine shop area with automated equipment turning out hundreds of small parts like strut bushings and shaft ferrules.

I'd heard that the business was a family operation, so I guess I was thinking smaller. It is, indeed, primarily a family business. Remy Haynes Sr., his business partner Pete Calimano, Remy's two sons Remy Jr. and Chris, and Remy Jr.'s fiancee, as well as a couple of friends of the family all work there, so it is a far bigger operation than I had imagined.

Remy Sr. was in the middle of a project on a milling machine making rudder hinge brackets, so he called Remy Jr. out of the fiberglass shop to give me a tour. I took a number of photos of the machine shop area, and using the adage of one picture being worth a thousand words, I refer you to them and their captions.

On a work table at one side of the shop were two projects which caught my eye. One was a prototype hull for a new X (or F) outrigger which they have been developing. They have worked with Gary Russell, a prominent west coast racer, to develop the boat using the small B. H. Hansen, Zenoah gas engine for propulsion. Gary says, "Many European and U.S. speed

■ LEFT: Parts of the Cheddar Pintail steam engine with vertical boiler which has been partially assembled. ■ ABOVE: The pistons of the Cheddar Steam engine which reciprocate and are driven in both directions by steam power. ■ BELOW: Remy Haynes Jr. holds one of the scale boat hulls Aeromarine manufactures. Many of the other hulls they make can be seen in this display area.



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Remy Haynes Jr. checks one of the semi-auto lathes which is producing stainless steel strut bushings which area" then lined with lead teflon. Other such machines produce parts for flex shaft collets and for flex shaft ferrules.

records have been set with speeds up to 68 mph with a gas engine. They preferred that I did not photograph the new prototype design. I'm looking forward to another beach trip this spring to photograph the new boat in motion with its Zenoah engine. Watch for a future article.

The other was the nifty little Cheddar steam engine which they were assembling. It has twin cylinders, but it is a reciprocating engine, so it has the power of a four-cylinder. The steam pushes a cylinder down and at the end of the stroke the cylinder housing makes an eighth of a circle turn, which closes one steam port and opens another to push the cylinder back up. This happens on both sides of the engine simultaneously. The engine has several built-in safety features, too, such as the pistons being held to the central housing by spring tension so if the steam pressure gets too high they push against the springs and bleed off some steam until it's in the correct operating range.

I asked about taking photos in the fiberglass shop area where they lay up their hulls so I could show the process in action. Regrettably they requested that I not take photos there because of the problem of a few unscrupulous or thoughtless people who copy a design in which many hours of development have been invested. Remy Sr. explained, "If a fellow copies a boat for himself, and sells boats to five of his friends that's six boats out there that look like ours, but aren't really the same quality. You multiply that times a number of people who might do it at various times and various parts of the country and it can really jeopardize the reputation of our time-tested design and thus our company's survival. I'm afraid that your pictures might show them the one little thing they are missing about how our boats are built, which might allow them to make a copy of our boat almost as good as our original. That's one reason we got into the hardware line, because people aren't going to buy an expensive automated lathe or milling machine to copy a few pieces of hardware."

But I was able to take a couple of pictures of the shop showing the area where they build the boats and their master copies of bulkheads, stringers, and transom plates.

Adjacent to the fiberglass shop is an area containing racks of numerous silk screens for printing the various decal logos which may be applied to their boats.

At the time I stopped by their facility they had not gotten a sign by the highway to advertise for walk in business (they had given me easy directions on the phone). Much of their business is mail and phone order and hobby shops. In the shipping area, which was lined with boxes of parts, Chris Haynes was packing four Sprint Cat hulls and assorted other parts in a gigantic box, "The biggest UPS will take," he said.

They have a nice display area set up and by the time you read this, it will be enlarged to 2000 square feet for a full line hobby shop, with airplanes, cars, etc. Their present building is more than three times the size of their former facility in Babylon, New York. It had burned, destroying most of their molds and machinery. Remy Sr. is knowledgeable about model airplanes, having flown them quite a bit. They have also molded some gas model car bodies as well as their scale and race boats. One other interesting fact which they related is that at their first facility in New York, they built about twenty full-sized 35-foot sportfishing boats and numerous full-sized offshore race catamarans. No wonder they do such a nice job on the small ones! •

SHOP HINTS *continued from page 52*

XURON'S 1-1/2" SCISSORS

In 1992 we were introduced to Xuron Corporation's 410 tapered tip microshear and 450 tweezernose 4" pliers (reference review issue) and thoroughly impressed with both items and said so when we met Mark Hamilton, sales and marketing manager, at a trade show.

"You have to try these," he enthused, and began to demonstrate what Xuron's new stainless steel modeler's scissors could handle. Mark cut through sheets of basswood, styrene, and 0.016" brass, then finally a metal wire so thin it had to be picked up with pliers. Each cut was close and clean with not a trace of residue. The scissors, Mark explained, was on its second four-day show. It was as sharp as when it left the factory.

Back in the studio, we tried the little scissors (blades are 1" long) on sheets of 1/32" plastic, brass, and 1/16" marine ply. We were pleased with how smoothly they cut through the various materials with a minimum of pressure. Only the ply needed some sanding. The 2" long by 3/4" wide openings in the plastic handles comfortably accommodate your fingers, and make it easy to control. One scissors fits right or left-handed.

Working with high quality tools produce a lot of enjoyment. There is pride of ownership and that feeling of accomplishment when viewing the end result. The money spent now will make it possible to work more precisely, comfortably, and quickly for years to come. If you're still using that pair of scissors you found in the back of the junk drawer, treat yourself. Invest in a pair from Xuron.

For a free catalog write: Xuron Corporation, c/o Mark Hamilton, 79 Main Street, Suite 3, Torrington, CT 06790; (203) 489-6513.

OLSON'S JEWELER'S & COPING SAWS

The jeweler's saw and coping saw from Olson Saw Company both feature their new blade tensioning end screw. The jeweler's saw frame (JSF2000-3) is of sturdy design, and gives no signs of flexing under use. Although we've always gotten along well with the standard adjustment to the frame for tensioning the blade, someone who has struggled with setting the old-fashioned tensioner will find the additional wing nut a definite improvement.

The wing nut is loosened first, then the new blade inserted like normal with teeth pointing toward the handle. Tighten the frame first, followed by the wing nut. A half turn is about as much torque as you want, otherwise the blade can be pulled from the bracket. When tensioned properly, a blade will sing if plucked.

Our biggest complaint about this jeweler's saw and most others is the thumb screw used for holding the blade. The screw quires considerable clearance when saving on the left-hand side. By replacing it with a short, slotted-head screw, the problem is removed. Even though it's a little more awkward to install the blade, the added clearance is worth the effort. A hex bolt or Allen screw would work as well.

We truly believe that jeweler's saws are God's gift to the model builder. For doing fine cutting in hard woods or metals, it can't be beaten. One should have all four frames (2", 3", 4", and 5" depths) and have a different blade in each one, because the most difficult part about using a jeweler's saw is changing the blade. The process also is hard on the blade, for it's highly vulnerable at this point.

We bought a coping saw when we first started building models and quickly became convinced that it was a worthless piece of tooling. However, upon seeing Olson's version (CSF4000), we decided to give coping saws another chance. To our astonishment, we found ourselves reaching for the saw more and more often when roughing out. The frame is stiff and the blade control excellent. Because the blade can be turned to cut in any direction, the saw is particularly useful for close work. It's really great for removing excess stock from carving blanks.

As a blade is used, it stretches. Previously, there was no way to compensate for this. Olson's end screw allows the distance between pins to be adjusted, putting an end to that problem. A properly tensioned blade makes accurate cutting possible. If you've been disappointed with coping saws in the past, it's definitely worth your while to give Olson's a try.

A package of 5" skip tooth scroll saw blades with reverse teeth is available. The reverse teeth, on the bottom of the blade, are designed to score the underside of the workpiece and prevent it from chattering during sawing. Sure enough, it did, while producing a clean, smooth cut. Blades are available in sizes ranging in width, thickness, and teeth per inch.

When we want to do faster cutting in wood of a complex design, we install a scroll saw blade in the jeweler's saw. Naturally, we wondered how the skip tooth blade would work in it. Alas, there was no advantage.

If your hobby shop or hardware store doesn't carry them, write to Olson Saw Company, c/o Charles Olson, Director of Sales & Marketing, Bethel, CT 06801-0262; (203) 792-8622. •

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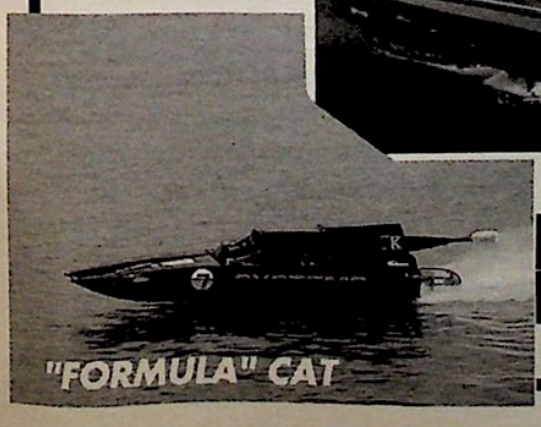

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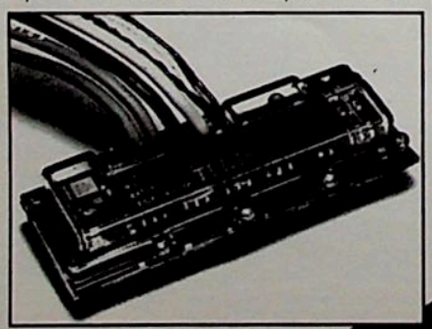

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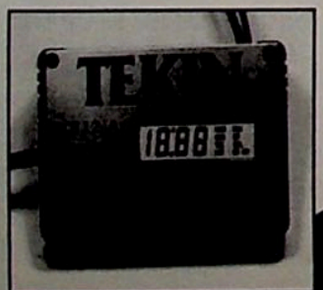

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BUILDING A TUG cont. from page 13

platforms. 26 guage wire was run down the mast to provide power, with sockets made from hypodermic tubing connecting the lights to the power source. A ceramic resistor reduces the power from the ships 6-volt to 1.25 volts for the lights. At this voltage they last longer and also are not quite as bright, which to my taste looks more realistic.

The same lights were used around the perimeter of the cabin. They were mounted in fixtures made from brass tubing and acrylic rod turned and polished. These were all wired to a central barrier strip to allow easy replacement should one burn out.

The lifeboats and their handling equipment were the last major items to be constructed. The boats were vaccum-formed over a pattern made from brass and acrylic. Once formed, they were cut from the sheet and detailed with Evergreen strip styrene, primed and painted. Rub-on letters were used for the boat's name.

The davits were cut from a sheet of .040 in a "C" section, with strip styrene added to the perimeter for additional detailing. Brass sockets were made for the various moving parts, and a variety of items were used for detailing, from railroad switch boxes to small diameter solder. They were rigged with waxed thread, and mounted on the boat with Zap.

With the boat finished, she was taken out for trials. The Hitec speed control works beautifully, allowing the most precise control imaginable over the propeller. Steering is very good, and she backs reasonably for a single screw vessel, due to the propeller which has a very shallow pitch. She is stable in most weather, although for extra insurance in choppy water I have added a rod that extends from the deck through the inner superstructure to add against losing the cabin through excessive rolling.

It took about three months spare time from start to finish, which was a pleasant break from multi-year projects. She looks good, performs well, and was easy to build. If you are thinking of a similar project, you could do far worse than try one of The Scale Shipyard's tugboats. •

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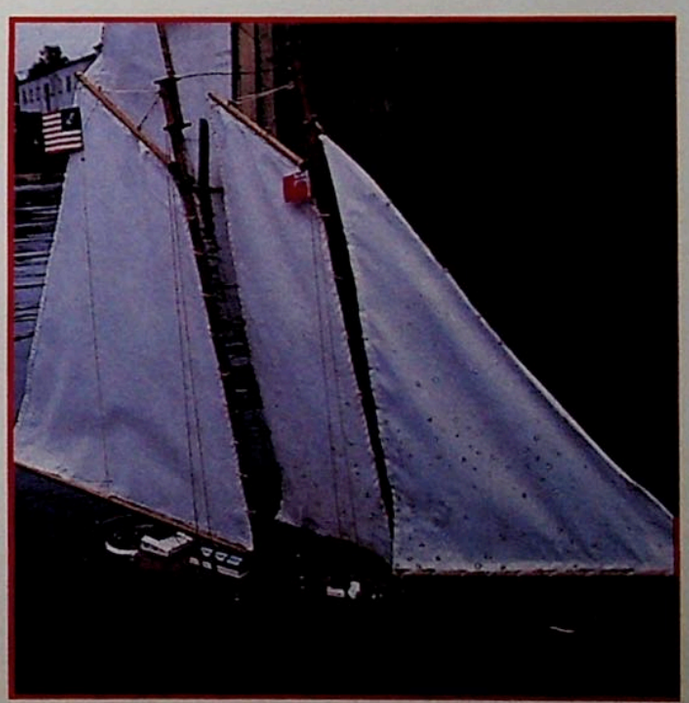

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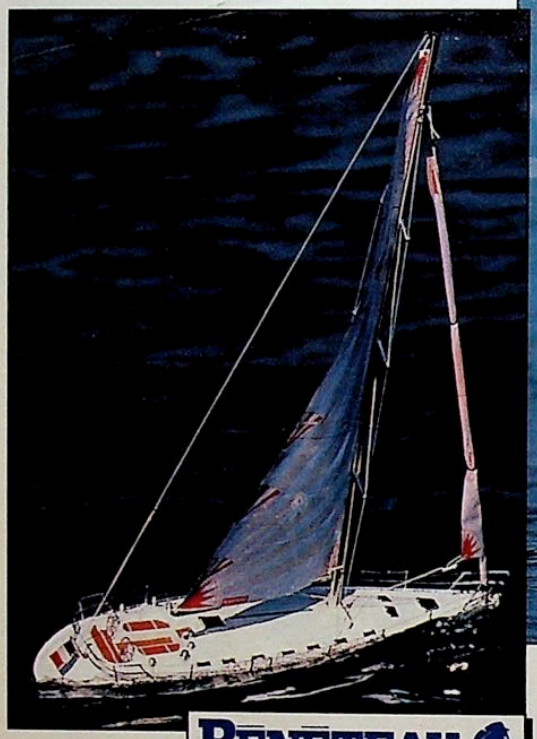

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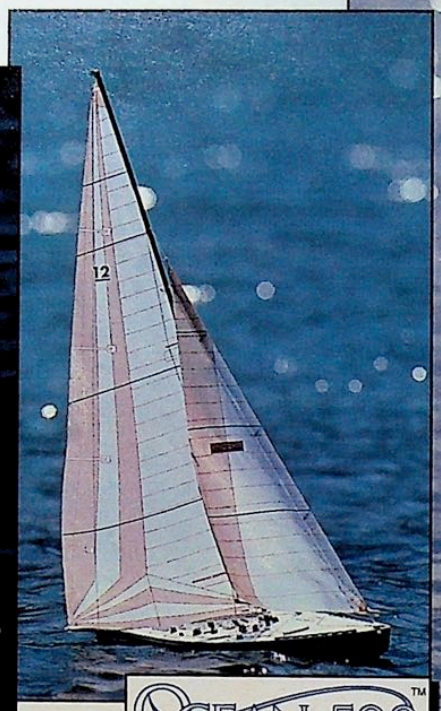

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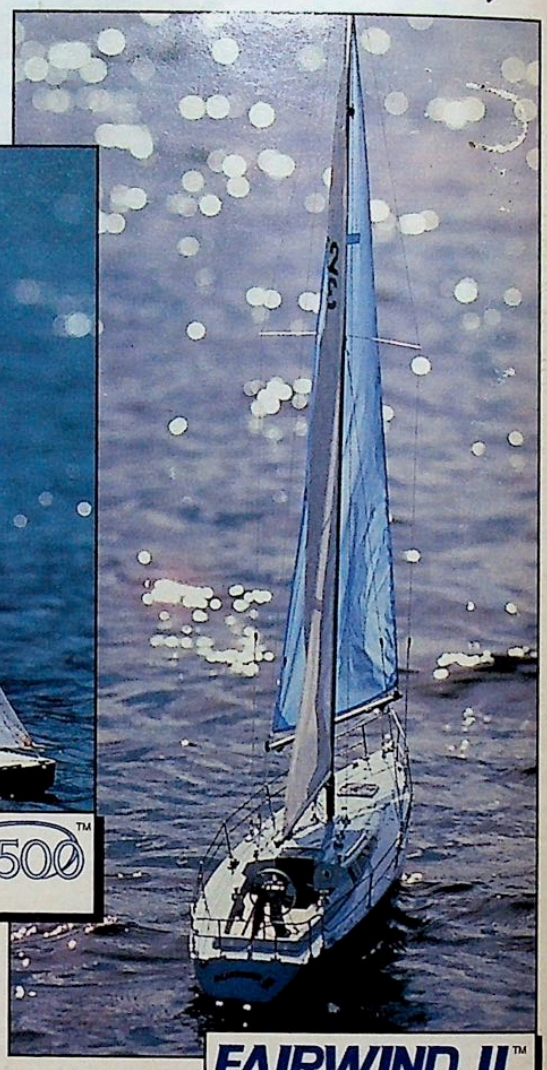

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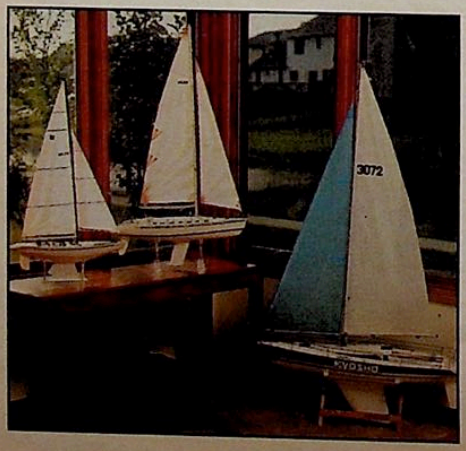

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